GENERAL INFORMATION

MARCH 1959

ARMY INFORMATION DIGEST

THE OFFICIAL U. S. ARMY MAGAZINE

ARMY INFORMATION DIGEST

THE OFFICIAL MAGAZINE of the DEPARTMENT OF THE ARMY

The mission of ARMY INFORMATION DIGEST is to keep personnel of the Army aware of trends and developments of professional concern.

THE DIGEST is published under supervision of the Army Chief of Information to provide timely and authoritative information on policies, plans, operations, and technical developments of the Department of the Army to the Active Army, Army National Guard, and Army Reserve. It also serves as a vehicle for timely expression of the views of the Secretary of the Army and the Chief of Staff and assists in the achievement of information objectives of the Army.

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MAN is the key element in Command, both in the light of observations by the Commanding General of U. S. Continental Army Command, and the Commandant of the U. S. Army Command and General Staff College writing in this issue.

Front and back cover scenes depict the ground soldier teamed with rifle and air vehicle which endow him with the firepower and mobility so essential to the accomplishment of his ground-gaining mission.

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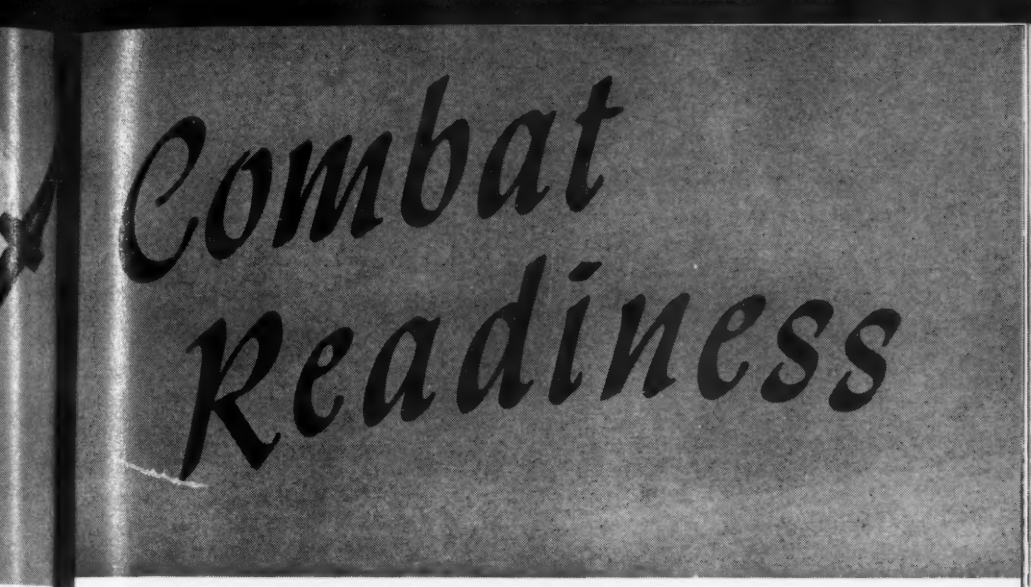


IS OUR JOB

General Bruce C. Clarke

THE primary job of the United States Continental Army Command begins with MAN and never ends.

While the accompanying charts and illustrations show USCONARC's position in the Army establishment, area of responsibility, organization and functions, the most eloquent illustration is the cover photograph of the combat soldier. Keep his image in mind while reading about our job. He is the focus of all we do.

His readiness to do his job on the ground in any kind of war, any where, any time, IS our job.

There is a big difference between MAN when he takes the enlistment oath and MAN when he can take the objective in battle. Eliminating the difference is part of our job. The other part is developing organizations, tactics and tools that will enable his *son* to take the objective in the future. We work on both parts at the same time.

THE scope of USCONARC's current effort is indicated by these statistics for fiscal year 1959:

Our six major training centers and four combat divisions are producing 224,100 replacements for the Active Army, 44,000 for the National Guard and 26,500 for the Army Reserve.

Our 30 schools are educating more than 150,000 United States and foreign military students enrolled in 642 resident courses, ranging in subject matter from electronics to geopolitics. In addition over 130,000 students throughout

the Army are pursuing non-resident courses.

At the same time we are continuing to train the 375,000 soldiers in units of the six U. S. Continental Armies, 300,000 in units of the Ready Reserve, and we are supervising the training of 400,000 National Guardsmen.

From the Reserve Officer Training Corps, composed of 235,000 cadets at more than 700 universities, colleges and high schools, we will graduate 14,000 commissioned officers this year for service in all components of the Army.

Meanwhile, too, we are maintaining the evolution of the Army in the field. In addition to the Combat Developments and Materiel Developments Sections of our headquarters at Fort Monroe, 55 field agencies are involved in this task. Of these, seven provide liaison with industry. Activities of the others range from human research to field-testing of tanks.

THE never-ending job of combat readiness projects chronologically as a series of focal points. At each point diverse military and scientific efforts representing years of research, development, testing, and production must converge to provide the American soldier with the best possible organization, training and equipment.

In the past these focal points graphed like this: ". . . . . ."

In the future they must graph like this: "————————."

Oceans and allies no longer give us years to make our efforts meet after war begins. Technological progress on both sides of the Iron Curtain during this decade has erased our margin of time and space. Henceforth our capability to field the best-trained, best-equipped and best-led soldier in the world must be exerted *continuously.*

Continuous combat readiness means that the products of our materiel development and military training programs must constantly mesh with the changing requirements imposed by tactical evolution. This evolution has been greatly accelerated recently by the advent of nuclear firepower and long-range missiles. So must be the process of meeting its requirements.

To accomplish this, we must find ways to reduce LEAD-TIME—both in hardware and in human skills.

Our approach to the problem is based upon five fundamental principles. If they seem very familiar, they should be! The industrial might of the very civilization

GENERAL BRUCE C. CLARKE is Commanding General, United States Continental Army Command, Fort Monroe, Virginia.

"There is a big difference between MAN when he takes the enlistment oath and MAN when he can take the objective in battle."

we are preparing to defend was built by their application.

FIRST PRINCIPLE

BUILD ON WHAT WE ALREADY HAVE THAT IS USABLE.

Newton credited application of this principle for all that he contributed to the advance of science. "I reached so high because I stood on the shoulders of others," he said.

By applying the principle to rocketry, the Army put the first Free World satellite into orbit. Part of the foundation for this achievement was laid by more than a century of ballistic development in the Army.

Just by using an existing part in the production of a new combat vehicle recently, our Materiel Developments Section was able to reduce the lead-time of the vehicle from five years to three years.

By classifying men according to usable civilian skills during basic training, we save training time and money in meeting the Army's requirements for technical skills.

As the result of studies by Army human research agencies, we are now able to build upon the preservice experience and personality traits that make some men better fitted than others for assignments to specific arms and branches. Combat adaptability tests that earmark men with fighter aptitudes will save training time and produce readier combat units.

What social science already knows about human behavior can also be applied to improving methods of military instruction. By so doing, human research units have developed ways to reduce training times for some military and technical skills up to 40 percent.

SECOND PRINCIPLE

ELIMINATE FALSE STARTS AND EXPENSIVE TRIAL AND ERROR BY THINKING OUT PROJECTS IN ADVANCE.

Applied in architecture and engineering, this principle produced the Empire State Building and the Golden Gate Bridge. Beginning with the training of the individual soldier, opportunities to apply it in our job knock on every door.

For example, we can replace the time-consuming dry-run habit with the lifesaving habit of doing things right the first time. This is now receiving command emphasis at all of our 100 Class I installations and in the training of our National Guard and Army Reserve units.

To help work out our most complex problems, we now have electronic computers capable of performing a million man-hours of computations in a minute. So aided, we can scientifically predict the potential of organization, weapons, and tactics at the idea stage. This is now being done by teams of scientists and soldiers under the direction of our Combat Developments Section.

One of these teams is now engaged in war-gaming concepts in the 1970-80 time frame to sift probabilities from the multitude of possibilities. Another team is scientifically field-testing concepts for future operations at our Combat Development Experimentation Center (CDEC) at Fort Ord, California.

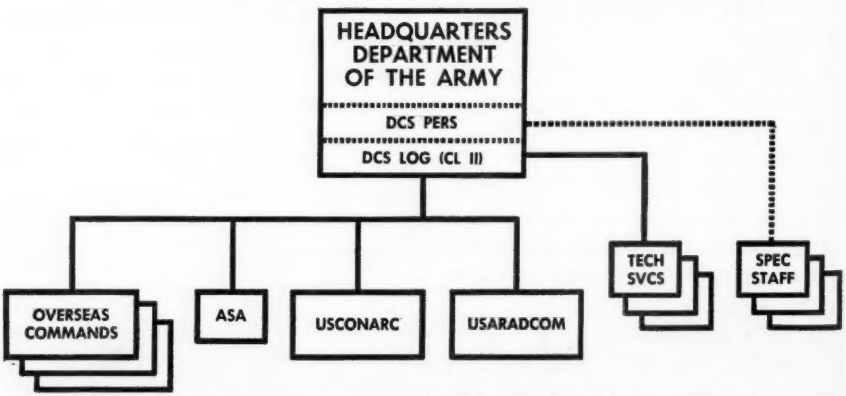
THIRD PRINCIPLE

CONCENTRATE ON THE ESSENTIAL. ELIMINATE THE NON-ESSENTIAL.

Henry Ford, Sr., applied this principle to the automobile and made a hundred million dollars. Even simpler than his original model is the definition of what is essential in our business:

"The soldier must be able to move, shoot, communicate and sustain himself on the battlefield. Everything that contributes to this

Position of USCONARC within Department of the Army



USCONARC is the short title for United States Continental Army Command. The Commanding General reports directly to the Chief of Staff, United States Army. The area of command responsibility includes all installations of the six U. S. continental armies and the Military District of Washington except for those charged with logistical support (Class II installations) which are the responsibility of the Technical Service chiefs.

"Realism has priority over administrative considerations, field training over personal comfort as affected by adverse weather and terrain."

end is essential. Everything else is non-essential."

Meeting this criterion in training means that tactical training has priority over all other activities. Realism has priority over administrative considerations. Field training has priority over personal comfort as affected by adverse weather and terrain.

Long-range missiles and nuclear firepower make it essential that our units be skilled in moving and fighting under cover of bad weather and darkness. So night training has priority over convenience and ease of control.

All of these priorities are emphatically pointed up in the current training program of the Command for units of the Active Army, National Guard and Reserve.

APPLYING the principle of essentiality to materiel development entails realistic recognition of three modifying factors: (1) the multiple possibilities of war; (2) the rising costs of military hardware; and (3) the need for strategic mobility.

So factored, the criterion of what is essential today assumes radically new aspects. In many cases, it is no longer enough that an item be useful for fighting one kind of war or in a particular geographical location. It must be useful in all climes and under all conditions of modern battle.

It is no longer enough that a new item of equipment contribute to the combat effectiveness of the American soldier for it to be deemed "essential." The contribution must have a high ratio of effect per dollar.

Nor is it enough that the item be the best for the job on the battlefield. It must be transportable by plane or fast ship and it must be mobile after it gets there.

While we are making progress in meeting these modifications of the criterion, we recognize that we must move much faster. Both science and industry have been alerted to the urgency of our need. By our joint efforts we intend to accelerate the trend away from bulkiness, heaviness, and frills.

Tactical as well as economic reasons make it imperative that we concentrate on the essential in materiel development. To field the compact, hard-hitting, fast-moving field army demanded by the conditions of modern battle, we must drastically reduce its impedimenta. The reduction must begin at the idea stage of development.

No matter how insignificant or routine a requirement may seem, it is important that it be screened for possible elimination. For example, requirements for a field typewriter case and a typist's stool were eliminated by our Materiel Developments Section recently with the observation that an empty food ration box could be used for both.

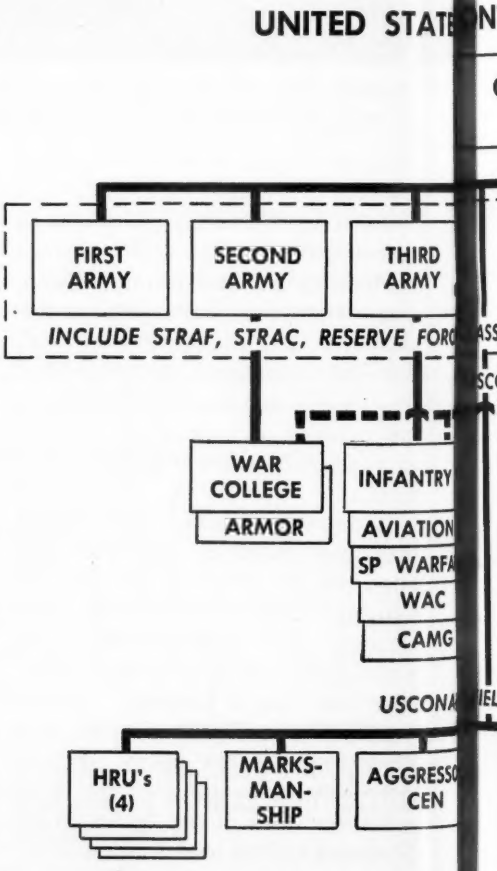
FOURTH PRINCIPLE

DO THINGS CONCURRENTLY INSTEAD OF CONSECUTIVELY.

Applied to manufacture, this principle produced the assembly line—time-saving key to mass production. Applied to military instruction, it produces integrated training—time-saving key to building battle-winning habits.

Instead of doing one thing at a time, we are integrating practical application of combat skills into every possible hour and type of activity of the soldier's day. For example, when a unit moves from barracks to a training area, it marches in tactical formation. When the unit halts or bivouacs, it practices measures of security, camouflage, concealment and dispersion.

An example of applying this principle to materiel development is our recently adopted weapons system. It provides for concurrent development of everything necessary for combat use of a weapon during its development stage.

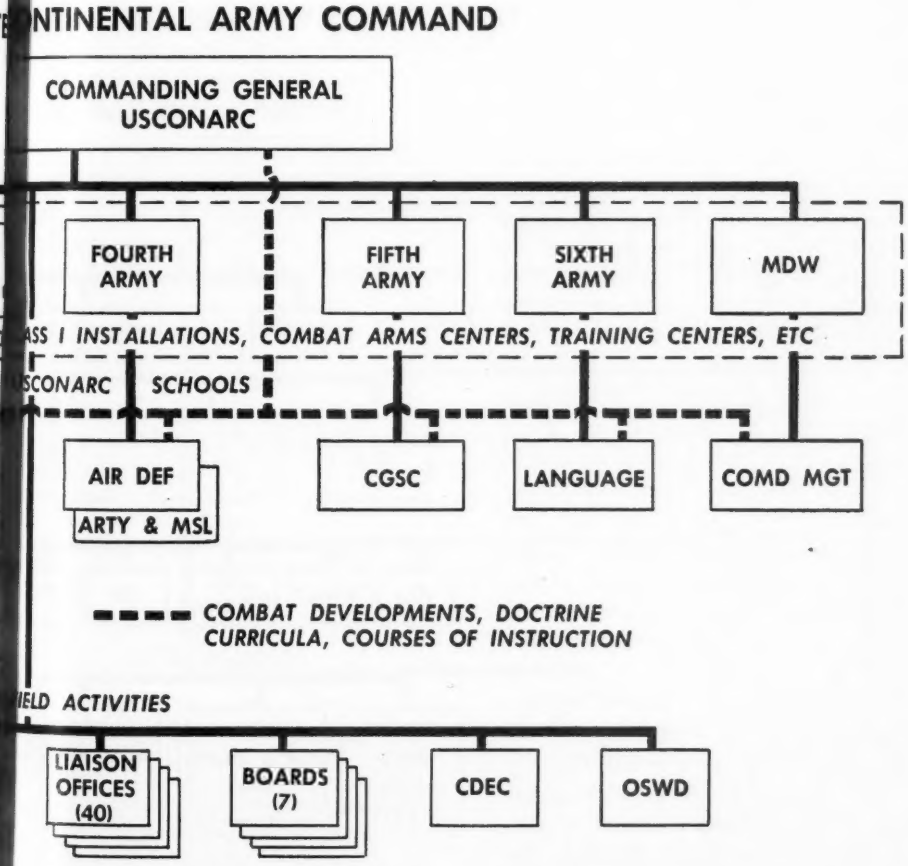


Through this decentralized organization the Commanding General, USCONARC, carries out his five major responsibilities: (1) Ground defense of the United States, including overseas reinforcements, domestic emergency as-

Ammunition, communication, transport, target acquisition, even training aids for employing the weapon—all are integrated into one development project.

At the same time doctrine and techniques for tactical employment of the weapon are developed by the appropriate Combat Arms Center. Liaison teams provide for expeditious exchange of information gleaned from on-the-spot observations and consultations.

More frequent and efficient application of the principle of concurrency to materiel development will reduce lead-time by years. Although present laws governing the award and funding of contracts may require revision for optimum efficiency, there remains much that we and industry can do to further streamline step-by-step procedures. Studies with this objective are continuing at the Department of the Army and USCONARC.



sistance, mobilization planning and coordination. (2) Combat developments. (3) Army-wide training and military education. (4) Development and control of Reserve Forces and ROTC; additionally, criteria and supervision for National Guard training are provided. (5) Logistical support of Active Army and Reserve Forces in the continental United States.

FIFTH PRINCIPLE

MAINTAIN CONTINUITY OF EFFORT.

Application of this principle is analogous to exploiting the law of inertia. Stops and starts waste both time and energy. By following through on a project we gain momentum instead of losing it.

An example of applying this principle to military instruction is contained in our current training program. Instead of breaking up the training day into short periods of unrelated subjects, units are scheduling "blocks of time" devoted to the same and closely related subjects. Psychological tests confirm that this speeds the learning process.

To provide continuity of effort in the process of military evolution is one of the principal reasons that USCONARC was established by the Department of the Army. Here is a brief resume of how we work at the process:

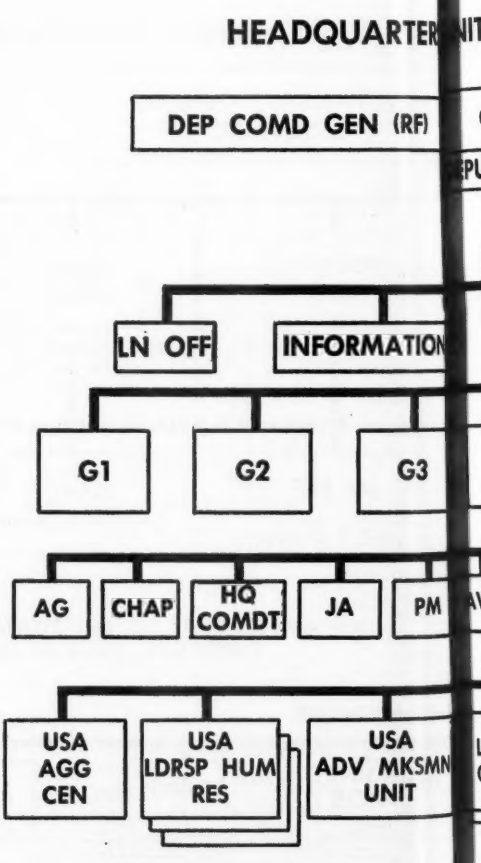
By analysis of future goals within a given time frame, our Combat Developments Section produces new concepts of operations applicable to the time frame. Next, organizations to carry out the new operational concepts are developed. This in turn identifies critical materiel items not yet developed. As soon as technological progress makes realization of a materiel item probable, qualitative requirements for it are passed to our Materiel Developments Section.

Working through its field agencies which include a board at each of the Combat Arms Centers, the Materiel Developments Section establishes specific military characteristics of the item and a description of the end product. This is sent to the appropriate Technical Service in the Department of the Army where a design is prepared.

Upon approval of the design by us, prototypes of the item are constructed. Then the item is tested. If it performs acceptably, we recommend to the Department of the Army that it be adopted.

KEEPING COMBAT-READY

FROM idea to actual employment of the item in battle, we

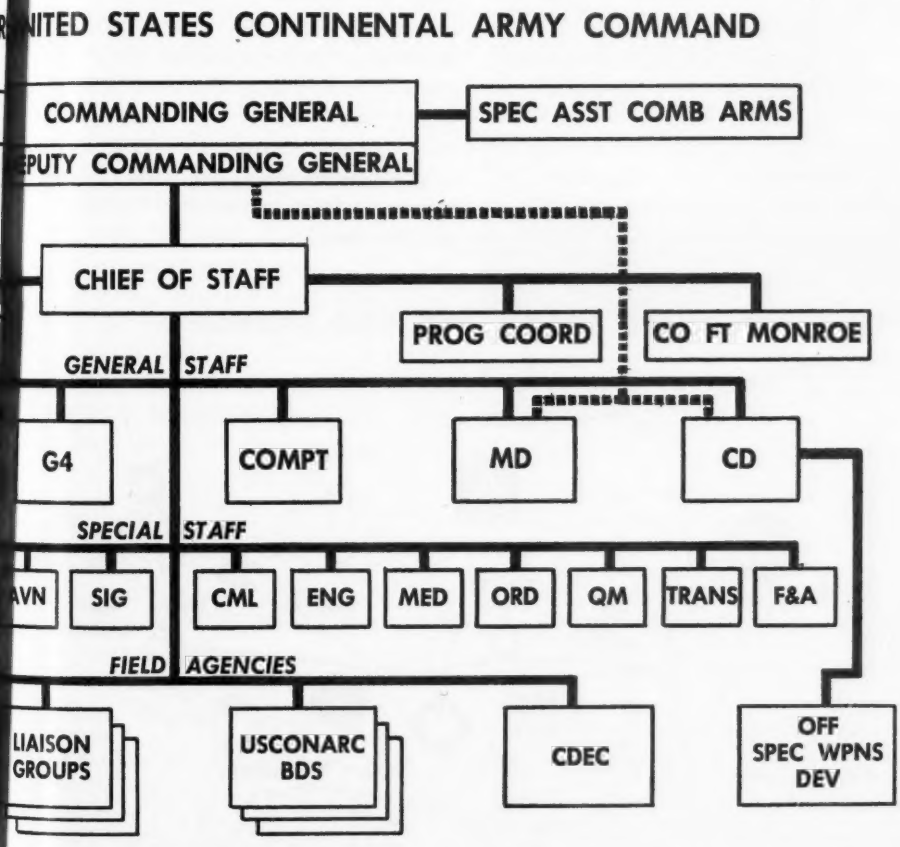


A special feature of the staff organization of USCONARC headquarters is the direct supervision and coordination of the Combat Developments and Materiel Developments Sections exercised through the Deputy Commanding General. In keeping with the tight-

represent the ultimate user—the combat soldier. Throughout the entire process of its development, our field representatives check to insure that the item will fit his needs.

Though continuity of effort is thus provided for in military evolution, I am convinced that we can foreshorten the process by more efficient application of all five principles. This is particularly necessary in the realization phase of an equipment item. Unless the time lapse between design and mass production is short, the item may become obsolete before it reaches the troops.

The most immediate aspect of combat readiness that concerns us is maintaining a round-the-clock capability for speedy reaction with sufficient force to deal with any emergency from a brush-fire action to general war. Our spearhead for exerting this capability is the Strategic Army Corps, composed of the



knit relationship between the Combat Arms demanded in modern war, the offices of separate chiefs have been abolished and their functions combined in a single Special Assistant to the Commanding General. Provision of a Deputy Commanding General solely for Reserve Forces is appropriate to the importance of the Army Reserve and National Guard as integral parts of the Army and to the USCONARC role as the mobilization base of the Army.

101st and 82d Airborne Divisions, the 4th Infantry Division, and other units.

By applying the same time-saving principles that guide our approach to the entire problem of combat readiness in their training, logistical and alert procedures, STRAC units have reduced reaction time for alert elements below the time currently required to provide them with air transport. Within minutes of an order sending them anywhere in the world, a continuous flow of combat troops can be enroute to loading sites.

Behind the STRAC spearhead must be a capability to expand the flow of combat-ready units to any degree required by the nature of the emergency. Our blueprint for exerting this capability is the mobilization schedule.

Adherence to the mobilization schedule means that every unit of the National Guard and Ready Reserve must maintain a degree of readiness appropriate to its mobilization priority. At present a gap exists between the priority and the readiness of some units. By applying time-saving principles in their training program we are making progress in closing the gap.

IN outlining our approach to the problem of reducing the lead-time for combat readiness, I have indicated only a few of the numerous ways we are applying the five principles which guide our efforts. However, many of our efforts are still in their infancy. Innumerable opportunities to apply these time-saving principles to every aspect of the problem remain unrecog-

USCONARC BOARDS AND FIELD AGENCIES

Geographically depicted here are the principal boards and field agencies by which USCONARC trains and improves the Army of today while developing the tactics and tools of the future. Not shown is Arctic Test Board in Alaska.

U. S. Army and Allied officer discuss map maneuver during instruction at Command and General Staff College.

nized or unexploited. Commanders and staffs throughout the Command are digging into all of our activities to unearth such opportunities, and I assure you that we shall mint what we mine.

Our target is a 50 percent reduction in the lead-time for combat readiness!

Training-wise, that will mean a reduction of 1,000 hours in previous estimates for fielding a combat-ready division. This, of course, represents a significant monetary savings. More important, it will permit a larger, faster flow of combat-ready units to reinforce the ground shield of the Free World in case of attack.

Materiel-wise, it will mean an average reduction in lead-time per equipment item of about three years. While it is impossible to estimate accurately the monetary savings involved, obviously it will be an imposing sum. More important, it will provide more modern tools in the hands of troops trained to use them.

Of paramount importance, it will mean the saving of life and the strengthening of your Army's power for peace. The life of the American soldier is too precious to be measured in money. The life of our country is too precious to be measured in men. Continuous combat readiness is the only measure that can safeguard both.

That is the reason for the United States Continental Army Command, and the gist of the job that begins with MAN and never ends!

Branch Transfers

Transfers of officers from overstrength grades is being encouraged to offset shortages in certain commissioned grades. Department of the Army Circular 614-3 cites the branches and grades in which significant shortages exist—

Adjutant General's Corps, major, captain, first lieutenant; Artillery, major, captain, first lieutenant; Chemical Corps, major, captain, first lieutenant; Corps of Engineers, lieutenant colonel, major, captain; Finance Corps, lieutenant colonel, major, first lieutenant; Military Police Corps, major, first lieutenant; Ordnance Corps, colonel, lieutenant colonel, major, captain, first lieutenant; Signal Corps, colonel, lieutenant colonel, major, captain, first lieutenant.

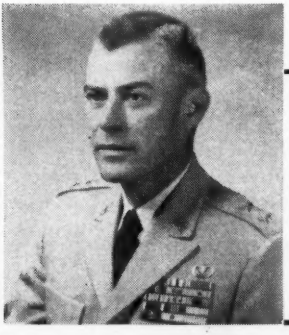
Atoms for Air Defense

Major General Dwight E. Beach

FROM the standpoint of national security, the current era of the Twentieth Century marks a sharp break with the past. Usually after a major war the Nation has relaxed into strictly peacetime pursuits, with military affairs of minor concern. Army mobilization planning was geared to a slow build-up in the knowledge that trouble was remote and that intervening oceans and potential allies provided a cushion of time while the Nation girded itself for battle. All of this has now been changed by the uneasy peace since World War II.

As a result of scientific developments in supersonic aircraft and missiles, time and space have been telescoped and reaction time has been reduced. At best, reaction time is now measured in hours; with the advent of the intercontinental ballistic missile, it will be measured in minutes.

Since the introduction of atomic weapons, the possibility of successful penetration by even a small number of enemy aircraft or missiles is a cause for serious concern. In the air, the Soviets have the elements of a long-range bomber force, and there are evidences of major activity in the long-range missile field. All this adds up to more immediate danger to the



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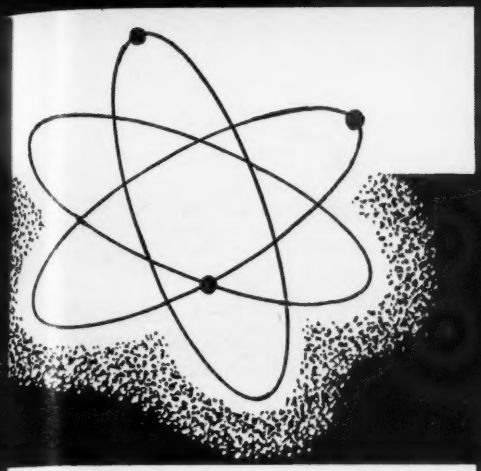
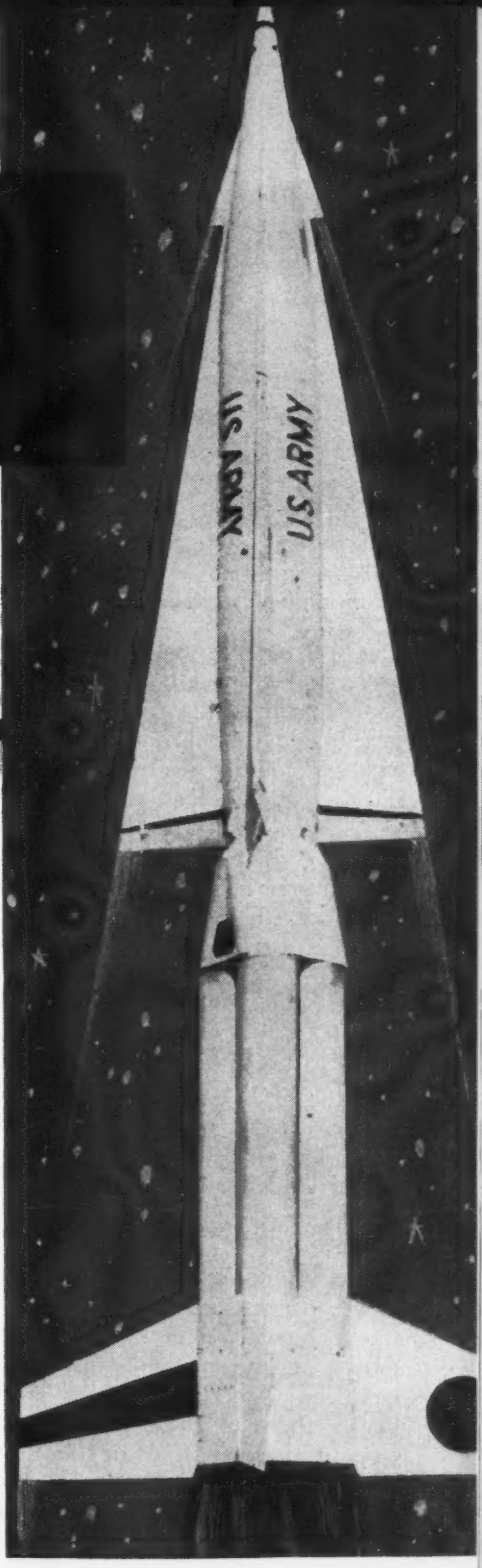




home-front than in the past. Everyone's home town is now closer to the scene of possible action.

These developments have brought to the American scene a new kind of soldier—a guided missile crew member deployed in the continental United States, instantly alert, on a twenty-four-hour-a-day basis. While other Americans heave a sigh of relief, close shop after a hard day's work and prepare to relax at home, these soldiers man the Nike sites which dot the suburban landscape.

ARMY Nike units are part of the over-all defense team required for United States national security. In all, four categories of forces are required to meet the threat of enemy aggression—(1) a powerful retaliatory force, (2) adequate continental air defense, (3) strong

"Nike-Ajax is now deployed throughout the United States in defense of industrial, highly populated, and strategic areas."

overseas deployments and (4) necessary naval and air means to assure freedom of movement for the strategic combat ready forces and reserves.

To deter an attack on the continental United States through the threat of retaliatory punishment on the enemy's home-front, the Nation relies on the heavy bombers of the Air Force and Navy. For maximum deterrent effect this offensive force must be guarded against a surprise attack by an adequate continental air defense capable of inflicting serious loss on any enemy who risks an attack on the continental United States.

Another essential category of deterrent forces is represented by United States ground forces deployed overseas. They are a visible shield against aggression and a source of support and encouragement to America's allies. And finally, there are those forces necessary to preserve that freedom of strategic movement which any country requires if it is to conduct successful military operations.

The Army contribution to the Nation's air defense consists of Nike units operated by the United States Army Air Defense Command (USARADCOM) with headquarters at Colorado Springs, Colorado. Operational control of the Nike units and all other air defense weapons deployed in the United States is exercised by the Commander-in-Chief, United States Continental Air Defense Command. This command is comprised of Army, Air Force and Navy units. (See "Army Antiair—the Nation's Shield," November 1957 DIGEST.)

NIKE-AJAX

AS early as 1944 the Army outlined its requirements for an air defense projectile which could be controlled during flight — one which could combat future enemy aircraft flying at such high speeds and high altitudes that conventional antiaircraft artillery could not cope with them effectively.

Concerted efforts to solve this problem led to the development of the Nike-Ajax missile system.

Initially deployed in late 1953, Nike-Ajax was this country's first operational surface-to-air guided missile system.

Nike-Ajax is designed to destroy the enemy target regardless of evasive action. With its high explosive warhead, it measures about 20 feet in length and about one foot in diameter. The missile is a supersonic, two-stage unit employing a solid-propellant booster and a liquid sustainer motor. Missile and booster together weigh more than one ton. Because of its speed, range, altitude and lethality, the Nike-Ajax can meet an attack from any direction. Its kill potential has far exceeded expectations.

NIKE-AJAX is now deployed throughout the United States in the defense of industrial, highly populated, and strategic areas. Permanent emplacements, including underground magazines, are utilized but the system itself is mobile.

Essentially, the Nike system consists of two parts—the missile and associated ground launching and handling equipment, and the ground guidance and control equipment. The latter includes radars, a computer and communications equipment. One of the radars is an acquisition or search radar which detects the approach of distant aircraft. Another is a tracking radar which picks up the target and feeds information regarding its location and movement into the computer. Finally, there is a radar which tracks the Nike missile throughout its flight and transmits steering orders to it.

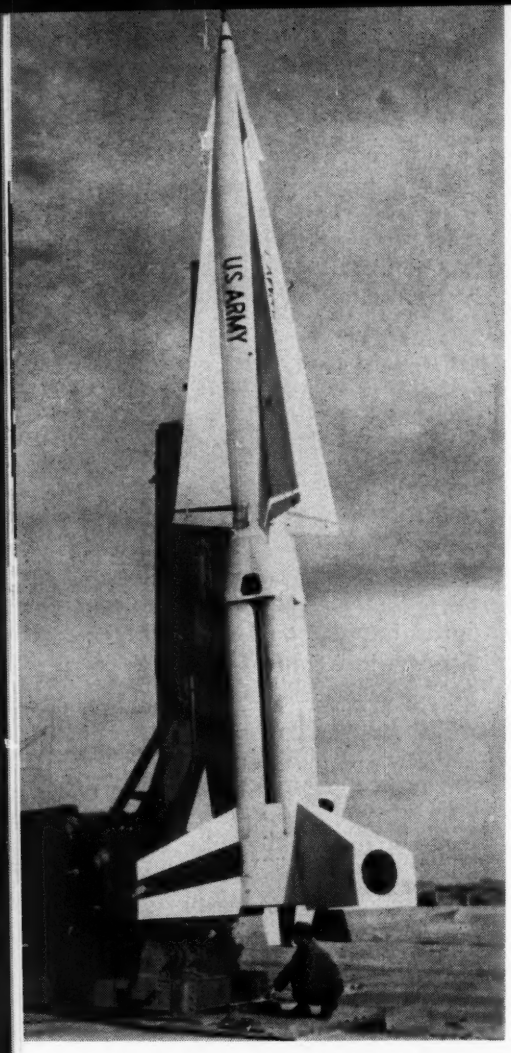
UNDER the United States Army Air Defense Command, Nike units are grouped into Regional Commands throughout the United States. (See "Vigil in the West," April 1958 DIGEST.) Under each region there are Army Air Defense Artillery Groups with two or more Missile Battalions in each. Each battalion has a Headquarters and Headquarters Battery and four Air Defense missile batteries.

The Headquarters and Headquarters Battery is charged with command, administration, operations, maintenance, supply and communications. Each missile battery consists of two platoons—the fire control platoon and the launching platoon. A typical Nike-Ajax battery consists of twelve missile launchers, manned by just over one hundred officers and men.

In a typical engagement, warning of the approach of a hostile aircraft comes from the early warning system operated by the Air Force. The Nike battery acquisition radar continuously searches the sky for approaching aircraft.

While still many miles distant, the target is acquired by the battery acquisition radar and is designated to the target tracking radar. Using information from the target tracking radar, the computer begins recording the path of the hostile aircraft. In the meantime, the missile tracking radar is trained on a missile. At the appropriate moment the missile is launched.

From that instant onward, the target and missile tracking radars work in unison, one locked on the target, the other on the missile. On the basis of data from these radars, guidance is provided the missile to intercept and destroy the target. Any evasive action taken by the target is immediately detected and



corrective information is given to the missile.

Each Nike missile battery undergoes annual firing practice at permanent Nike ranges located in the United States. While the men are at their positions in permanent Nike installations around the clock, they receive constant training in maintenance, repair checkout, and operation of the system.

NIKE-HERCULES

NIKE-AJAX as an ever-alert, instantly ready operational system has served the country well. But already looking to the future, the Army has developed—and is currently placing on operational status—the second generation of the Nike missile family known as the Nike-Hercules.

"Looking to the future, the Army has developed . . . the second generation of the Nike family—Nike-Hercules."

The Nike-Hercules will have both an atomic and a non-atomic capability. Besides being much faster than Nike-Ajax, its substantially greater range enables it to exploit the range capability of modern radar, providing increased capability at extremely high altitudes, as well as an improved low-altitude capability. The dart-shaped Nike-Hercules missile is approximately four times heavier than its predecessor.

Development of the Nike-Hercules does not mean that Nike-Ajax missiles have become obsolete. Hercules ground equipment can launch and control both Ajax and Hercules missiles. Furthermore, this new ground equipment actually improves the capabilities of Ajax missiles. Thus a Nike battery could launch Hercules missiles with either atomic or non-atomic warheads to combat hostile targets which are beyond the effective range of Ajax. The Ajax missile would be launched against targets within its range where the more costly Hercules missiles are not always needed.

Nike-Ajax missiles will continue to be effective against supersonic bombers and cruise type missiles. When equipped with an atomic warhead, the Nike-Hercules will have the capability to destroy

entire enemy bomber formations far out from vital installations.

ATOMICS IN AIR DEFENSE

WHEN the Department of Defense first announced incorporation of nuclear weapons in the Nation's air defense in 1957, it was pointed out that the gradual introduction of nuclear weapons had long been planned and had no relation to any specific current event. Pending international agreement on safeguarded disarmament, the United States, like other responsible governments, was taking these prudent steps to guard against possible attack in the future.

The Department of Defense has pointed out that nuclear weapons provide by far the most effective form of defense against air attack, making it essential that these new weapons be incorporated in the Nation's air defense system. These weapons moreover provide a further deterrent to aggression against the Free World.

SAFETY FEATURES

NOW that certain atomic weapons may be routinely handled at various military installations, the question invariably arises—just how safe are they?

Supersonic Target Hit

Successful firing of a Nike Hercules air defense missile against the supersonic XQ-5 target recently accomplished at White Sands Missile Range, New Mexico, is believed the first time that any air defense missile has destroyed a target moving at more than 1500 miles an hour and at altitude of more than 12 miles.

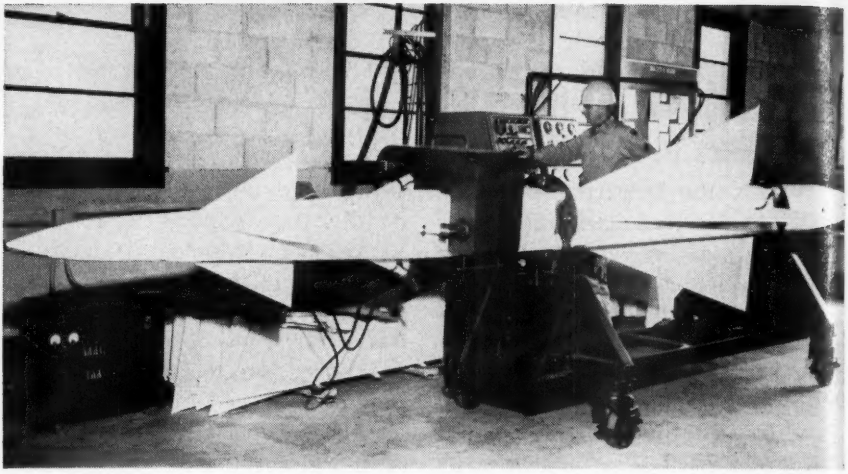
The military services have for many years successfully designed weapons which will destroy an enemy when required to do so but which are nevertheless safe to handle. As an integral part of its weapons development system, the Army and the Atomic Energy Commission provide for a continuous safety study of a weapon from its conception to operational employment. Special committees, set up for each weapon, are charged with the responsibility for ensuring that safety is considered throughout its development.

In the case of Nike-Hercules, elaborate precautions have been taken, both in its design and handling, to prevent accidents. Tests conducted by the Atomic Energy Commission have confirmed that the possibility of a nuclear explosion occurring as a result of an accident involving either fire or impact is virtually non-existent.

AS A RESULT of extreme care in design of equipment and procedures for transporting and storing atomic weapons, there have been no inadvertent or unintentional nuclear detonations. No harmful radiation hazard exists with respect to atomic weapons in their storage configuration.

Atomic weapons do, of course, present a probable hazard commensurate with conventional weapons and materials. A recent example in which a nuclear weapon was accidentally dropped from an airplane near Florence, South Carolina, and the absence of any nuclear detonation demonstrates this fact.

Construction at Nike battery sites incorporates many built-in



"While the men are at their positions . . . they receive constant training in . . . operation of the weapon system."

safety features for the handling and storage of explosive materials. Stringent safety requirements apply even for non-atomic warheads. Underground magazines and earth barricades at existing sites further contribute to the safety of the surrounding area.

Those who have visited a Nike battery site will recall the large open areas around the launchers. The distance from the launchers to outer area is based on safety criteria applicable to storage of normal explosive materials in order to confine any accident to the Nike site itself. The accuracy of such safety criteria was exemplified by an accident in May 1958 near Middletown, New Jersey, in which several Nike-Ajax warheads were exploded on site with no casualties in the adjacent community.

IN THE absence of factual information, the public may be concerned regarding the possibility of defense-inflicted damage—*i.e.*, radioactive fall-out and damage to personnel and buildings caused by our own missiles—when atomic warheads are employed in the air defense battle.

Tests conducted by the Atomic Energy Commission in coordination with the Department of Defense have demonstrated that atomic warheads which might be used in air defense weapons result in no fall-out hazard if detonated at certain specified altitudes above the ground. On 6 April 1955, a high altitude test of a nuclear air defense device was conducted at the Nevada Test Site of the Atomic Energy Commission. No damage from blast, heat or radiation occurred to property or individuals. In fact nuclear radiation on the ground, even directly beneath the point of detonation, could be

Nike-Hercules to Alaska

Nike-Hercules missiles and crews will be on site to defend strategic areas in Alaska early this year. They are to be placed in defense areas in the Fort Richardson-Elmendorf AFB-Anchorage and also the Eielson AFB-Ladd AFB-Fairbanks complexes.

measured only with the most sensitive scientific instruments. An individual directly exposed would have received less than one-hundreth of the radiation dose normally received in a standard X-ray.

In its general configuration, too, a high altitude burst has different characteristics. A high altitude burst first appears as an intense flash of light followed by the formation of a white cloud. The mushroom-shaped cloud commonly associated with nuclear detonations is not present, since the mushroom stem normally results from the interaction of strong vertical air currents with surface materials.

Safe altitudes for use of atomic weapons are dictated by the effects of blast and heat on the ground below the burst. This minimum safe altitude of detonation has been determined by actual test, and the Nike-Hercules system has been designed to prevent detonation of atomic warheads below the minimum safe altitude.

Perhaps the most important measure to prevent defense-inflicted damage is the automatic self-destruction features incorporated into the missile system. This feature causes the missile warhead to destroy itself at safe altitudes if, for any reason, the missile does not intercept and destroy an enemy aircraft.

This self-destruction feature automatically prevents detonation of either atomic or high explosive warheads below minimum safe altitudes. In addition, a manual override feature is incorporated in the ground control equipment, permitting the tactical control officer at a Nike battery to destroy the missile and warhead at any time after it is above the minimum safe altitude. Automatic or deliberate destruction of the atomic warhead insures that the missiles and warheads alike are destroyed instead of falling to the ground intact.

If a missile carrying an atomic warhead by some malfunction fails to reach the minimum safe altitude and falls to the ground, the hazard would be commensurate with conventional weapons and materials. A specific sequence of positive actions is required to ready the warhead for nuclear detonation, and this sequence is not completed until the warhead reaches the minimum safe altitude.

IN THE course of its development, the Nike system has moved ahead to meet each successive challenge to air defense. Next in order of availability is the system for defense against the intercontinental ballistic missile.

On 16 January 1958 the Secretary of Defense directed the Army to continue development of the Nike-Zeus anti-missile system—third generation of the Nike family—as a matter of urgency. This system, which is designed to defend the United States against an enemy ballistic missile attack, is already in the hardware stage of development.

In the meantime the Nike-Hercules, with its atomic and non-atomic capability, represents another step designed to insure that this Nation's air defense capabilities are equal to the challenge of any enemy who might attempt to rain destruction from the skies. Now that atoms have been teamed with air defense weapons, the Nike soldier is better equipped to safeguard Hometown, U.S.A.

A frontal attack on military discipline problems at the local command level has resulted in

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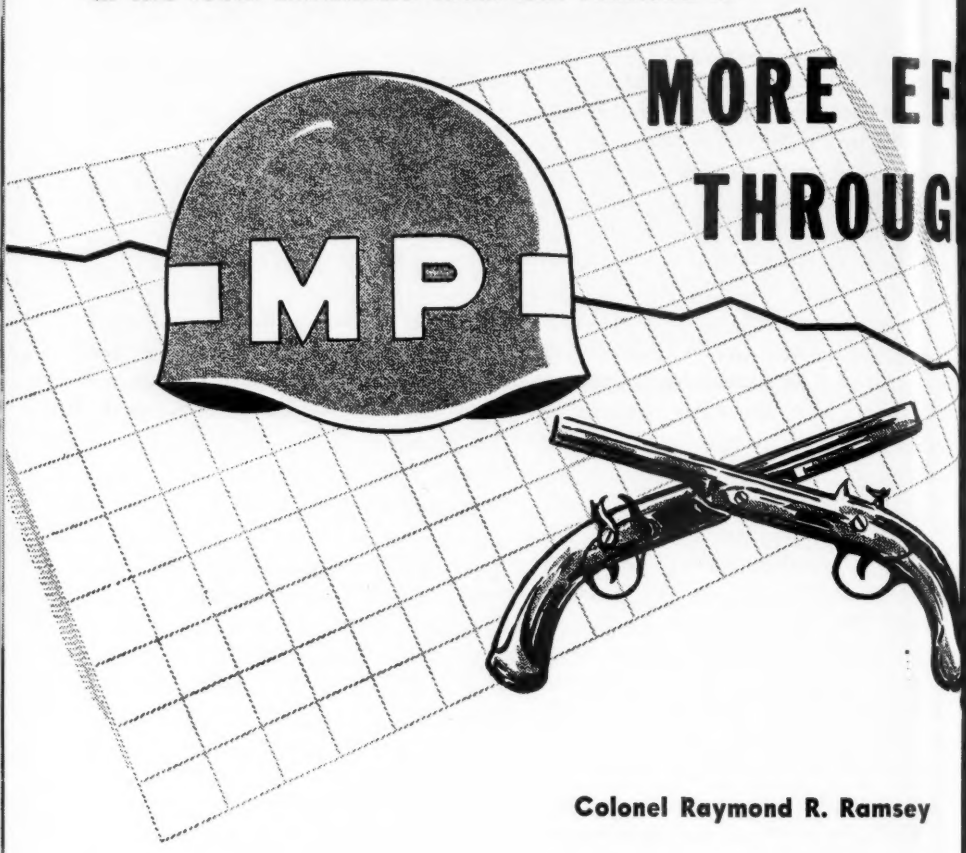


Colonel Raymond R. Ramsey

WITHIN the last four years, the prisoner population in post stockades throughout the Army has been reduced sufficiently to provide four infantry battle groups.

Currently the population in military stockades stands at an average of 3,500 as compared to 9,000 in 1954. While this has been a continuing process as a result of many factors, the sharpest drop has occurred during the past twelve months following implementation of a new correctional program Army-wide at the local level.

These impressive reductions obviously mean an attendant rise in overall efficiency, as well as a large and measurable savings in money and effective manpower—a savings that can be passed along to the taxpayer. Further, this reduction in the Army's stockade population is reflected in a similar decrease in the number of long-term prisoners at disciplinary barracks, which means still greater savings and increased Army effectiveness.

IN THIS frontal attack on the problem of military discipline, a

COLONEL RAYMOND R. RAMSEY, Military Police Corps, is Deputy The Provost Marshal General, Department of the Army.

EFCTIVE MANPOWER
UG IMPROVED DISCIPLINE

united effort never before attempted enlists the well-coordinated teamwork of the entire staff of the local command. The program, set forth in Army Regulations 210-181, is the result of investigation and surveys by The Provost Marshal General into many sociological and psychological factors beginning in 1954.

Historically it was found that the nature and rate of delinquency among military personnel are directly related to the military situation at any given time. During national emergencies, the Army receives enlistees and draftees with wide intelligence and educational qualifications, some having criminal as well as mental and emotional histories. Many are unable to make a stable adjustment to military service.

There is also the immature group whose absence from home and community restraints results in an abandonment of moral obligations. This group is particularly prone to temptations encountered in foreign service.

Shortly after the end of World War II, there were about 35,000 Army and Air Force prisoners serving general court-martial sentences. In 1949, the populations of disciplinary barracks dropped to 3,200. At the end of the Korean War, approximately 13,300 prisoners were confined in stockades, disciplinary barracks and Federal penal and correctional institutions.

During peacetime, the mission of the Army is to build and train a "hard core" cadre of highly qualified soldiers to form the nucleus for expansion. Enlistment and retention of substandard personnel during peacetime are costly in terms of money and manpower and contribute nothing to the accomplishment of the Army's mission. With the impetus of war gone, the marginally qualified individual is not motivated to face up to his training obligations and duties and very often succumbs to temptations. This is clearly demonstrated in the make-up of the Army's prisoner population.

Since World War I, the Army has gathered a considerable body of information helpful in predetermining an individual's military potential and performance. Of the many sociological and psychological factors considered and tested, only two appear to be reliably related to satisfactory performance by the ordinary soldier, and these have long been known—intelligence and educational achievement level. Studies of prisoners, in comparison

"An additional factor indicating the need for maintaining the current high standards for service in the peacetime Army is the number of prisoners with records of prior delinquency. In 1954, two-thirds of the prisoners in Army disciplinary barracks had a record of one or more prior convictions. In 1958, this has dropped to about one-half of the prisoner population."

with personnel of the Army as a whole, consistently show that a disproportionate number of prisoners come from the lower intelligence group.

An additional factor indicating the need for maintaining the current high standards for service in the peacetime Army is the number of prisoners with records of prior delinquency. In 1954, two-thirds of the prisoners in Army disciplinary barracks had a record of one or more prior convictions. In 1958, this has dropped to about one-half the prisoner population.

THE high cost of maintaining prisoners, both in terms of manpower and money, is of continuing concern to The Provost Marshal General. In the past, emphasis at the local command level was largely centered on assuring the custody of the prisoners and using them as a source of free labor—at least, it seemed like free labor. When viewed in terms of cost of guard personnel, loss of training time, increase in the number of non-combat personnel spaces and other factors involved, it was a very costly source, indeed, for whatever labor was performed.

Very often, too, soldiers returned to local stockades time after time to serve short sentences for relatively minor offenses. Inevitably, many of these "repeaters" later committed serious offenses requiring costly long-term confinement.

IN late 1954, the Office of The Provost Marshal General undertook a searching review of all past policies and procedures affecting prisoners. The purpose was twofold—

- to devise a modern correctional program which could be implemented at the local command level—one capable of identifying at the earliest possible moment those prisoners having a potential for further service and one which would assure prompt disposition of all other offenders, either by separation from the service or transfer to a major confinement facility;
- to devise a worthwhile program of corrective training that would enhance the potentially restorable prisoner's effectiveness upon return to honorable duty status.

Procedures were tested at a number of stockades, and the results of this study and experimentation were incorporated into the correctional treatment and disposition as provided in AR 210-181, published in September 1957.

Actually, the new concept of correctional treatment and disposition of offenders set forth in these Regulations is a simple one. Its outstanding success is due in large

part to the well-coordinated teamwork of the entire staff of the local command concerned with problems of military discipline.

Installation confinement officers, in cooperation with unit commanders, mental health specialists, staff judge advocates, chaplains, and other mature staff officers, are effectively screening and professionally evaluating all prisoners upon initial confinement. The prisoner's ultimate disposition, as well as his work, training and custody assignments, are determined promptly on the basis of this evaluation. Proper and effective use of administrative separation from the service and exercise of the commander's authority to remit or reduce sentences assures early disposition of many cases. Offenders serving long sentences for major offenses are transferred to disciplinary barracks.

Even so, this intensive process of screening, professional evaluation and disposition of prisoners might be limited in its effectiveness without the continuing operation of a properly constituted clemency board. Included in its membership are representatives of the Provost Marshal, Army Medical Service, Judge Advocate and Chaplain Corps. This board operates at the local level to review the cases of prisoners looking toward their early restoration to duty. Of major assistance to the local commander, their teamwork has contributed materially to the reduction of prisoner population.

It is too early to predict the point at which the present four-year trend of reductions in prisoner population will level off, because the full benefits of long-term application of the modern Army's correctional program have not yet been fully realized. There is, however, unmistakable evidence that great benefits are accruing on all sides—to the individual prisoner, his unit, the Army and the Nation.

Typical Clemency Board which assists local commander in correctional program is shown here in a formal meeting at Fort Belvoir, Virginia.

Army Aviation Trainees Meet the Test—

LIKE all of the Army teams today, Army Aviation faces the challenge of the nuclear age, and present trends in tactical developments indicate that it will grow in size, missions and responsibilities. Equipment is constantly being improved to provide necessary battlefield mobility to support new concepts, so that the young officer entering the field is assured of an interesting and varied career in the application of his knowledge of aviation, combined with continued proficiency in his basic branch.

Currently, initial flight training is being conducted in both fixed-wing and rotary wing aircraft, with about two-thirds of the students scheduled for fixed-wing, the remainder for rotary-wing instruction. Normally after three years of flight status, aviators will be cross-trained.

Training begins with primary pilot instruction either at Camp Wolters, Texas, for rotary-wing, or at Camp Gary, Texas, for fixed-wing aircraft. Both are former Air Force bases now operated for the Army by civilian contractors. At Camp Gary the student learns to fly the L-19 fixed-wing light plane. After that he proceeds to the U. S. Army Aviation School, Fort Rucker, Alabama, for the Army Aviation Tactics Course which provides final polishing touches in use of Army aircraft in support of ground forces.

TRAINING at the Army Aviation School includes closely supervised instruction on operation of aircraft from unimproved fields and road strips, low level navigation, and a variety of other subjects vital to safe and efficient utilization of Army aircraft. One of the most interesting phases of this course is a five-day field exercise which provides active participation and first-hand instruction on aerial resupply by paradrop and free fall, wire laying, aerial photography and adjustment of artillery fire. Here the student actually serves as a Division

Aviation Officer, Operations Officer, or another key position in a hypothetical unit. Instruction also is provided in instrument flying, enabling the student to fly aircraft under weather conditions unsafe for visual flight.

Besides the actual training at Fort Rucker, the young aviator also is able to observe the many and varied activities at the U. S. Army Aviation Center. These include advanced phases of aviation training; testing of aircraft and related equipment by various boards; development of new concepts and theories for employing Army aviation; collection, review and dissemination of information on aircraft accidents; and other operations pertaining to Army Aviation.

UPON graduation the flier can expect to be assigned to an aviation unit where he will utilize the instruction gained in flight school. Aviation is presently organic to a number of major tactical units, and a number of special purpose aviation units are being developed to meet increasing requirements for aerial surveillance, mobility and resupply in the nuclear age.

At the Army Primary Helicopter School at Camp Wolters, instruction includes eighty hours of flight training in the H-23 "Raven" observation helicopter, and covers ground school subjects on principles of flight, operation, maintenance and tactical employment of helicopters. For advanced training in larger helicopters, the aviator proceeds to Fort Rucker.

Beyond this, the wearer of the coveted Army Aviator wings can look forward to further advanced schooling and transition into many different types of aircraft now under development. These include the various designs of Short Takeoff/Landing or Vertical Takeoff/Landing (STOL/VTOL) type aircraft which will require minimum landing areas and still carry relatively heavy payloads.

Following are some pictorial highlights of Army Aviation training:

TRAINING BEGINS—

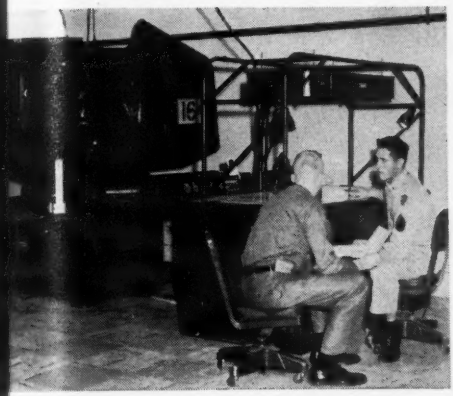
at Camp Gary or Camp Wolters, Texas, where the fledgling airman learns the basic facts of aviation that he will practice during his career in Army Aviation.

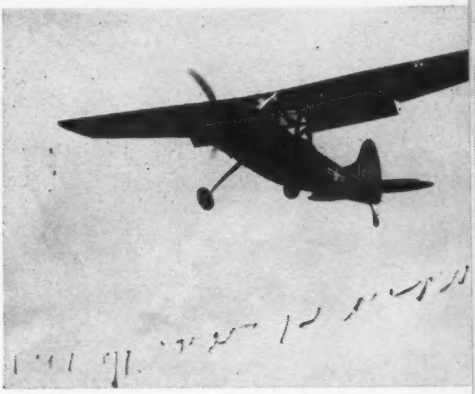
Here he is indoctrinated in the aircraft . . .

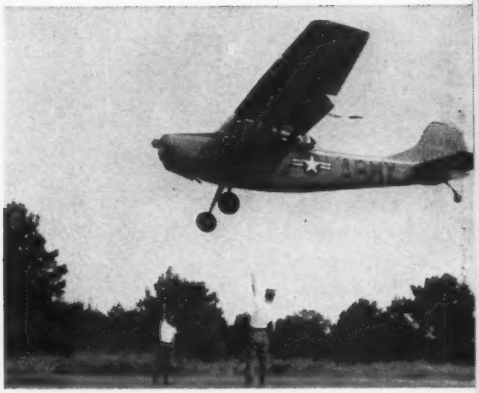
. . . Learns just what makes it fly, studies it closely at first hand, then makes his first flight.

THE AVIATOR ADVANCES—

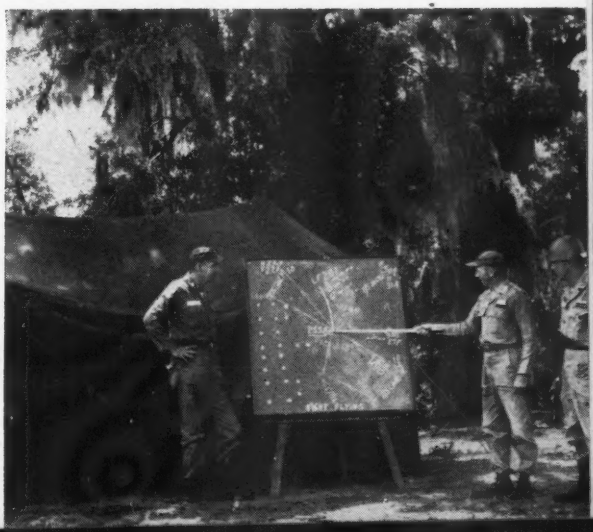
to the Army Aviation School, Fort Rucker, where he perfects use of Army aircraft in support of ground forces, as well as observing the many and varied activities at the U. S. Army Aviation Center.







He receives instrument flight training, practices landings over string barriers, learns to execute re-supply missions, picks up messages and takes part in a five-day field exercise.



HE FLIES HELICOPTERS—

at the Army Primary Helicopter School, Camp Wolters, where he also studies ground school subjects.

He receives briefing before a cross-country flight . . .

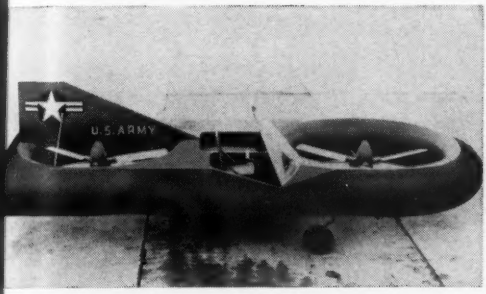
. . . and gains experience in actual operations of a helicopter.

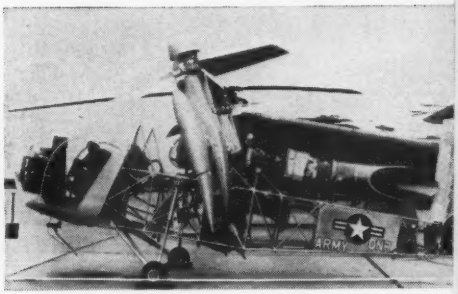
At Fort Rucker he may train with his crew in the H37 "Mohave."

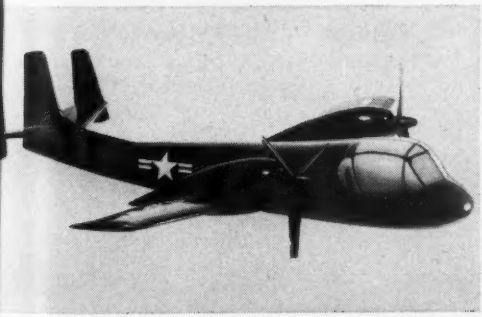
HE MAY LOOK FORWARD—

to further advance schooling and transition into many new, exciting types of aircraft now being developed, some already undergoing tests after being designed for Army use, others still on drawing boards. These include—

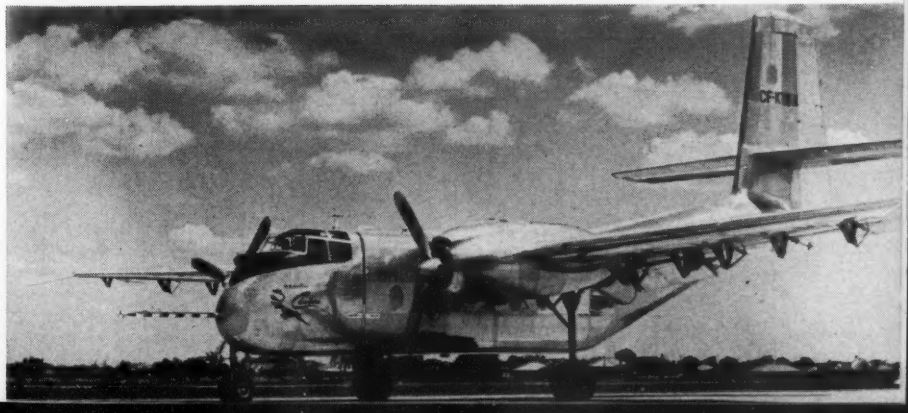
Bell HV-1A "Iroquois," first turbine powered helicopter.







Experimental Piasecki 59-K VTOL aircraft (left above). Vertol 76 experimental tilt wing aircraft (above). Grumman AO-1 "Mohawk" observation plane (left). DeHaviland DHC-4 "Caribou" under development (below).



Symphony of CO

Major General Lionel C. McGarr

WHEN "The Queen of Battle" supported by "The King of Battle" is combined with the "Combat Arm of Decision" and the important logistical "Services" under a single inspired leader, that all-important, balanced, cohesive entity known as "The Combined Arms and Services" is born. Its objective is Victory. Its controlling element is Teamwork.

In this *Combined Arms Team*, the catalyst of skillful leadership combines and integrates the individual capabilities of the various Combat Arms and Services into a truly great and victorious symphony—the "Symphony of Combat Power." The Army's leaders, like the symphony orchestra conductor, must use all their abilities to ensure an inspired performance.

Within the framework of the Army Educational System, the U.S. Army Command and General Staff College (USA CGSC), as the senior tactical school of the Combined Arms and Services, has the responsibility for this Combined Arms *approach* and the mission of assisting the Army in producing the necessary sound, professional leadership capable of applying this approach at Combined Arms levels.

TODAY with the frontiers of science and technology advancing

...IBAT POWER

at a pace far beyond our boldest dreams, the Army as an indispensable member of the Tri-Service Team must be both mentally and psychologically prepared. The challenge of change must be accepted if we are to ensure that newly evolving nuclear concepts are not merely extensions of conventional firepower and outmoded concepts. Accepting the challenge requires imaginative pre-planning and mental mobility of the highest order.

In this tension-laden, nuclear-missile era, conditioned by the deadly clash of opposing ideologies, the Army is dedicated, without complacency or compromise, to progress and improvement — the vital key to the "equation of survival." In recognition of this fact, the Army stresses versatile and realistic employment of progressively evolving new doctrine in exploiting the most advanced weapons systems. Even more important, the Army orients boldly on the future, seeking practical, valid answers to problems yet unsolved.

Of course, in capitalizing on technology, the Army recognizes it as an assistant—*not* a master. Man has been and will always remain the controlling element in war because warfare is not merely a pattern of mechanical energies and nuclear forces but one of human beings, their sense of values, and

their reactions under varying conditions.

Through the ages, it has been the military leader's unique ability to resolve the complexities introduced by the enemy, the elements, and technology into the simple realistic terms which have spelled success on the battlefield. To resolve these complexities requires military leaders of mental toughness and moral courage capable of successfully coping with any adverse combination of circumstances. It is also highly important that these leaders not allow the pressures of automation to affect their moral qualities and to stunt creative thought processes.

THE TRI-SERVICE TEAM

TO better understand the Combined Arms function of the "Army in the Field," it is necessary to place the Army in perspective within the framework of the National Defense Team while at the same time considering both joint and combined aspects. The continuing compression of time and space on the modern battlefield requires that the weapons systems of all three Services be tailored into the unified forces required for *each* area of operations. Also the mutual support and interdependence of all three Services are necessary to ensure a properly balanced, integrated tridimensional defense team. As this team must be capable of winning victory in *any* form of war or situation short of war, this requires both conventional and nuclear capabilities.

Further, interlocking worldwide military pacts, commitments, and military assistance programs ensure that United States forces will fight with allies in almost any conceivable war. Since the military forces of the majority of our allies are primarily *land* forces, the Army has special capabilities, responsibilities, and interests in this area. For, within the National Defense Team, it is the Army that takes and holds land — the natural element in which man lives and which he must control for his very survival.

THE COMBINED ARMS TEAM

LIKE the overall Tri-Service Team, the Army Team is an integrated fighting instrument, responsive to a clear chain of command, which exploits the characteristics of *each* of its components. No single branch of the Army is paramount or self-sufficient. Each has special capabilities, experience, and

MAJOR GENERAL LIONEL C. McGARR is Commandant, U. S. Army Command and General Staff College, Fort Leavenworth, Kansas.

skills which, when combined appropriately with those of other branches, produce the integrated Combined Arms and Services Team. Psychologically, these vital, special capabilities are strongly reinforced by the proud military traditions of each branch, which every experienced commander knows are intangibles of inestimable military value.

The Combined Arms and Services Team exists in division, corps, and field army which are the only *fighting* organizations in which all arms and services are an integral part of the team. Evolving organizational concepts are also extending the Combined Arms approach which previously existed in the Armored Combat Commands, into the Infantry and Airborne Battle Groups.

Naturally the problems of the Combined Arms Commander at any level would be simplified if fewer specialized component organizations were required. For example, a *single* divisional organization incorporating the close sustained and versatile combat capabilities of the Infantry Division, the firepower and battlefield mobility of the Armored Division, and the strategic mobility and airborne assault capability of the Airborne Division, *if feasible*, would simplify the ever-growing problem of control and command at higher levels. However, technology together with creative military thinking must dictate the desirability of, and speed with which, an "all purpose" division or, as an alternative, a "tailored" division may be accomplished. It is even possible that a new type of division will be forced by technology before any of the present divisions can have time to merge or possibly be eliminated.

"The team principle is fundamental to all our military efforts. Our interdependent Army, Navy, and Air Force work together to maintain the tridimensional power necessary to deal with any enemy on land, at sea, or in the air. Each member has a unique and essential role. Each complements and supplements the others."

Secretary of the Army
Wilber M. Brucker

Although considerable progress is being made in providing more versatile weapons and equipment, technology must still provide the ground soldier with the "skin and firepower" of a tank and a tank with the "light weight and wings" of a ground soldier if the all-important strategic mobility, versatility and firepower are to be attained. This high degree of strategic mobility applies with even greater force to STRAC-type components.

IN spite of advancing specialization, the traditional branch lines of responsibility are becoming increasingly less distinct and it appears likely that the significance of purely "branch" units will steadily decrease. Each new development has its impact, sometimes strengthening, more often weakening, traditional branch distinctions.

General Bruce C. Clarke, Commanding General, U. S. Continental Army Command, recently stated, "The Army is slowly approaching a branchless organization. We are a 'combat team' Army. It is a trend which I think

> **"The military mind has to provide not necessarily the perfect answer but, considering what is known of the situation, one that will work. That given, the commander has to back his judgment, face the risks, force his plan through, and stand or fall by the result."**
>
> ***Field Marshal Slim***

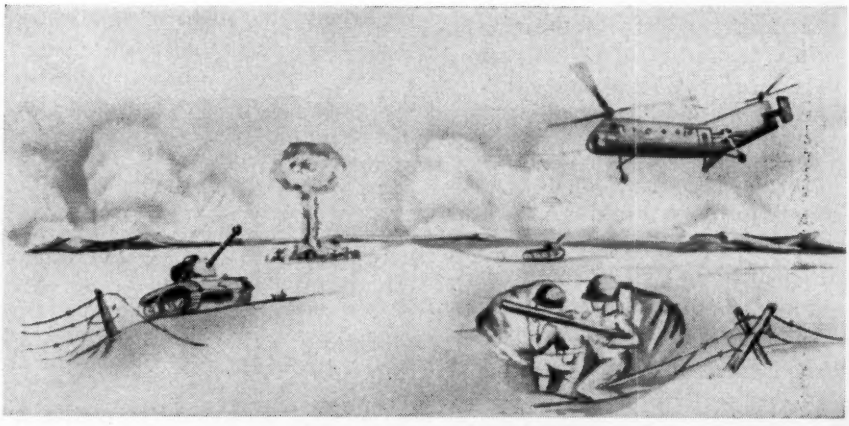
we should not fight but gradually deemphasize branch consciousness."

The education and training of Army officers is already in consonance with this trend. As a consequence, the combat arms must continue to shift in significant respects and adjust in detail as required by the overall growth and progress of the Army. Equally as important, since combat operations are no more effective than the logistical support on which they are based, the logistical and other services must also adjust to provide a more integrated administrative support system — ever-responsive to changing tactical concepts and environmental conditions.

The increasing complexity and specialization of the component elements of a command and its supporting weapons systems place an ever-increasing premium on commanders and staff officers with a "generalist" or combined arms approach. This is also true in civilian enterprise. In the military field as well as in the industrial field, the greater the specialization, the greater the need for the generalist type, and the more difficult it becomes to train and develop him.

Unlike industry, however, the Army's long standing educational system and military code can provide a planned and selective source of both generalists and specialists in the required numbers. The drastic reductions in battlefield reaction and decision time caused by new tactical doctrine for nuclear warfare gives more responsibility to a Battle Group commander than was delegated to very senior commanders in World War II. This fact dramatically underscores the urgency for the Army's educational system to produce better and more highly trained leaders than ever before.

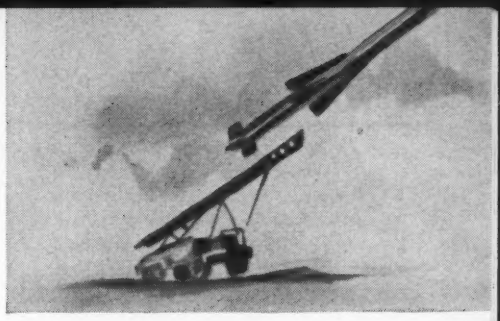
TO achieve the optimum Combined Arms and Services Fighting



Team requires a continuing objective appraisal of each component branch and supporting service concerned. Since the existing branch organizations and capabilities are the result of years of experience, necessary change, while bold, must be based on objective analysis and forward-looking professional military judgment.

Although it may appear that the contribution of one branch overlaps or duplicates that of other branches, this contribution may be necessary for the overall *adequacy* of the Team. For example, the very nature of combat often requires strength and depth in organizations and weapons systems. In this respect the battlefield team is very similar to the symphony orchestra which requires overlapping and duplication of the sounds of various instruments to produce the overall composite effect of the musical score.

In keeping abreast and ahead of technological requirements, it must be kept in mind that obsolescent weapons can be replaced by new models but that the human elements, of necessity, must be retained, reconditioned, and improved. Most certainly, progress requires change in the *approach and thought processes* of the Officer Corps. In this respect, it is a psychological fact that the human mind is normally bound by tradition and finds it difficult to visualize new ideas beyond its experience. Therefore, the most difficult task of the military architect is the "human engineering" required to change thought processes and responses. A related and equally time-consuming task is that of "tooling up" the Army School



System to reflect the requirements dictated by technological and doctrinal progress with a minimum of timelag.

THE SERVICE SCHOOL SYSTEM

THE Combined Arms Team, which is actually the Army in the Field, is developed and molded by the Army School System. The tools used are service school instruction, the training literature program, the combat developments system, and related field tests and exercises. These means are all designed to assist and support that all-important fighting combination—the combat commander and his troops.

The branch schools of the various arms and services produce branch-trained professional officers at company, battalion, battle group, and comparable levels, as well as special staff officers at all levels within the Army in the Field. The USA CGSC prepares selected officers as commanders and general staff officers at division, corps, field army, and comparable levels of the theater administrative zone. The Army War College, on a still more selective basis, educates officers primarily for the strategic levels — the theater and Department of the Army headquarters.

The missions of the Army Service Schools, together with their associated training literature and combat development programs, are directed and coordinated by Head-

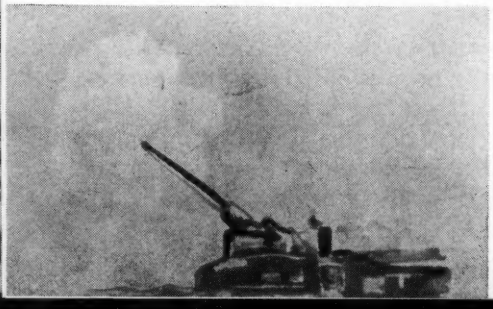
> **"War is an art, one based on scholastic foundation and resting on a free and creative activity."**
> ***General Ludwig Beck***

quarters, USCONARC, which in turn operates under the policy guidance of the Department of the Army. This direction and coordination provides a cohesive doctrinal and instructional system.

ROLE OF USA CGSC

WITHIN the Army Service School System, the USA CGSC plays a special role in *assisting* USCONARC in molding the Combined Arms and Services Team. As the senior tactical school, and college of the combined arms and services, USA CGSC represents *all* the branches, yet is the proponent for no one arm or service.

The broad instructional mission of the College is to "prepare officers for duty as commanders and general staff officers at division, corps, and field army, including their logistical systems, the theater army logistical command, and the theater army replacement and training command." The mission includes, at these levels, the joint aspects of airborne, air-ground, and amphibious operations as well as other related areas such as unconventional warfare.



Thus the College mission truly encompasses to a significant extent the entire area of the Army in the Field. For its level of responsibility, the College is made responsible by Army Regulations and USCONARC directives for doctrine and instruction in both tactics *and* logistics. As tactics and logistics mentioned above are inseparable on the battlefield, they are considered as an interacting and cohesive whole. This typifies the overall College approach to doctrine and instruction.

Leavenworth is one of the Army's two Colleges and the first level at which the school system becomes truly selective. For career professional officers, it is the keystone of their military education. Upon graduation, they form the hard core of the professional field grade officer leadership of the Army. Thus their education has an important impact on the Army's thinking and consequent rate of progress. This highlights the urgency with which the USA CGSC regards early incorporation of new concepts and doctrine into its instruction and the need for the Army to *lead and guide,* rather than to be led by technology.

FORT Leavenworth is a focal point in the Army's school system. Doctrine produced there provides the framework for further development by the branch schools. As directed by USCONARC, the USA CGSC reviews and comments on much of the doctrine and training literature prepared by these branch schools. In this respect the USA CGSC, as provided in Army Regulations, reviews all branch doctrine which affects combined arms and

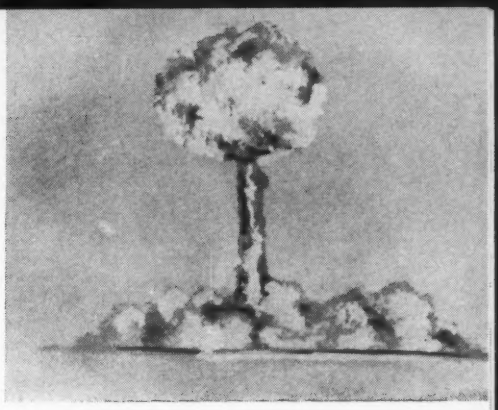
services doctrine. This is an essential step in the proper coordination and integration of doctrine. The College also plays a similar role within the combat developments system.

The College fosters inter-Service teamwork and understanding by instructing selected officers of the sister Services. In addition, it develops doctrine for the joint aspects of Army operations.

In the field of Allied officer education, the attendance of selected officers from 43 nations each year disseminates US military thought and knowledge world-wide. In addition, the presence of these officers at the College fosters Free World solidarity and directly contributes to the military education of the US students in combined operations.

The College nonresident instruction program reaches more than 13,000 off-campus students, most of whom are members of the Reserve Components of the combined arms team. The high quality and true readiness of these forces today is of greater importance than ever before. In addition, refresher courses, conducted on campus in the spring of each year, are attended by the commanders and senior staffs of all National Guard and Reserve Divisions and Logistical Commands, thus further welding the Combined Arms and Services Team.

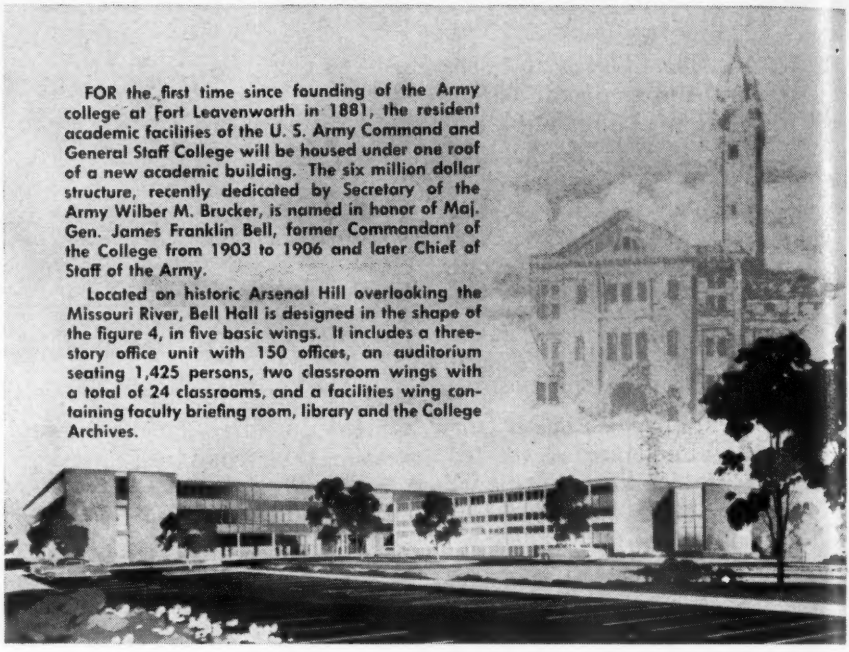
Major unit commanders and their *senior* staff officers are kept abreast of the latest developments in nuclear warfare and combined arms tactics by attendance at the two week Senior Officers' Nuclear Weapons Employment Course (SONWEC). Since its inception two years ago, 175 general officers have attended this course. The



USA CGSC *Military Review*, printed in three languages, and stressing the combined arms approach, also assists in keeping USA CGSC graduates up to date.

To further mutual understanding in the combined arms area, periodic doctrinal and instructional conferences are held by all components of the Army School System. By participating actively in such conferences and by liaison visits and participation in field exercises, the College keeps in close touch with Combined Arms and Services activities in the field, providing advice and assistance, and even more important, ensuring the realism and feasibility of its own work.

To accomplish the above tasks, Fort Leavenworth has been traditionally staffed with highly qualified officers of *all* branches of the service possessing the full range of general and specialized knowledge of the Army in the Field. This represents an important source of professional creative thinking at College level for the entire Army. On the USA CGSC Staff and Faculty, branch orientation and loyalties are objectively subordinated in the integrated combined arms and services approach required to best serve the overall interests of the Army as well as the branches.



FOR the first time since founding of the Army college at Fort Leavenworth in 1881, the resident academic facilities of the U. S. Army Command and General Staff College will be housed under one roof of a new academic building. The six million dollar structure, recently dedicated by Secretary of the Army Wilber M. Brucker, is named in honor of Maj. Gen. James Franklin Bell, former Commandant of the College from 1903 to 1906 and later Chief of Staff of the Army.

Located on historic Arsenal Hill overlooking the Missouri River, Bell Hall is designed in the shape of the figure 4, in five basic wings. It includes a three-story office unit with 150 offices, an auditorium seating 1,425 persons, two classroom wings with a total of 24 classrooms, and a facilities wing containing faculty briefing room, library and the College Archives.

COLLEGE REORGANIZATION

IN keeping with the Leavenworth tradition of continuing improvement and in response to the findings of the Educational Survey Commission, the College two years ago undertook a major reorientation and modernization of its curriculum and supporting organization. Among the principal effects was the accomplishment of a balanced flexible curriculum oriented on the forms of war contained in the Chief of Staff's National Military Program. As a related action, problem settings were moved into realistic worldwide locales, and realistic levels of use of atomics in varying conditions of warfare were integrated into the curriculum.

Realizing that in the future, as in the past, an important part of America's preparation for war will be in the *classrooms* of our military schools and colleges, the instructional philosophy was reoriented to prepare the students to a greater extent as problem solvers and decision makers. As part of the complete curriculum rewrite, strong emphasis was given to logistics in instruction and doctrine, and in College organization. In addition, the doctrine and combat development programs were reoriented and accelerated to stress a sound, feasible, combined arms and services approach.

As a matter of course, the Army selection system ensures the selection of students of exceptionally high personal standards. However, Fort Leavenworth is convinced that moral courage and personal integrity which affect military judgment and decisions can be further developed and refined in the classroom. In this respect, one of the major objectives of the College reorientation was an intangible: *Character development and the building of sound, professional and ethical standards.*

This quality, although difficult of precise measurement, has been and will always be an important hallmark of the successful leader. Students are required to consider ethical implications and decisions involving moral courage which assists in developing a sound, overall sense of values. Thus are stressed the importance of the intangible moral factors which can improve combat effectiveness, but which are too often taken for granted.

SUMMARY

ALTHOUGH concepts and organizations are in a state of flux, of one thing we can be certain: there will be *no* big, clumsy units on the nuclear battlefield—only small, elusive units which are easy to control, supply, and hide. This makes the Army urgently aware that the patterns and concepts of a once secure past no longer apply to the tension-ridden world today.

In this respect, general officers are not normally associated with a particular branch. Rather they must employ all arms and services objectively by *balancing, blending, and combining* branch capabilities into a team to achieve optimum results. The General Staff officer must also have this objective, overall, team approach. This integrated team concept combines all the elements of the force to form a completely coordinated entity which is responsive to one authority—the combined arms commander.

As a prerequisite, commanders and General Staff officers at all echelons require thorough training in the capabilities of all elements within the combined arms and services team. This is necessary to ensure that they exploit the full potential of this team in the employment of forces under their command. To achieve this, continuing emphasis on the combined arms and services approach is required throughout the Army school system as well as in the important doctrine and combat developments programs.

We must not only develop and maintain self-contained, hard-hitting, responsive organizations with greatly improved firepower and mobility, but also we must reorient the thinking and training of the leaders who will man them. The USA CGSC in contributing to this combined arms approach teaches its students to think objectively, decide logically, and operate effectively in the application of the important principles involved.

THE Combined Arms and Services approach produces a smooth working, victorious, fighting team analogous to a highly trained symphony orchestra. In the Army team we have the different combat arms and services working harmoniously together under a single leader to produce the "symphony" of the battlefield—SUCCESS. Its "score" is characterized by the deadly calm which precedes battle, followed by the drumfire of small arms muffled by the roar of conventional and nuclear artillery, with these sounds merging together in rising violence to a crashing crescendo highlighting the clank of armored treads and the defiant shout of the infantryman as he closes with the enemy —and through it all is woven the melody of *down to earth, practical leadership.* Teamwork and inspired leadership—this is the stuff of champions!

Performing a dual information and training mission "The Big Picture" reaches the Armed Forces

Master Sergeant Stuart A. Queen

BY ALL STANDARDS, both commercial and from the standpoint of the Armed Forces training mission, the Army's *Big Picture* weekly television series has been, and continues to be, an outstanding success.

Currently, this Department of the Army television program is carried on 320 (60 percent) of the Nation's 544 commercially-owned and educational television stations, on 5 commercially-owned stations in Alaska, 2 in Hawaii, and 5 in Puerto Rico. In addition, numerous Armed Forces Television Service stations air the program in all parts of the world where U. S. Armed Forces are stationed, bringing informational material designed to improve their appreciation of military service and encourage increased efforts in behalf of their careers.

The training and troop information function of *The Big Picture* is an invaluable one in that it brings into play a modern and effective medium capable of reaching dramatically and effectively with word and picture a large proportion of the Armed Forces. A study completed during November 1958 revealed that 91 percent of all Armed Forces installations in the United States are within telecasting range of one or more television stations carrying *The Big Picture.*

Of particular significance is the fact that 73 percent of TV outlets in the United States using *The Big Picture* show it on Saturdays and Sundays—days when a maximum number of military personnel are off duty and within range of their home television sets. This provides

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MASTER SERGEANT STUART A. QUEEN is assigned to the Office of the Chief of Information, Department of the Army.

a bonus of training and troop information during hours not charged against already tight training and work schedules. A review of the more than 250 individual episodes produced for the series revealed that every picture, either in its entirety or to a significant degree, benefited training either directly or indirectly.

Recent surveys have demonstrated that the public forms its opinion of the Army primarily through association with or impressions of the individual soldier. *The Big Picture* has consistently stressed the highest standards for emulation by the soldier. In addition, through the medium of television it has presented the model American soldier to an estimated audience area of 89,000,000 people each week.

AS a nation-wide and world-wide series, *The Big Picture* compares favorably with the best that commercial presentations have to offer. Knowledge of this fact serves as a powerful motivating force for Army Signal Corps cameramen and personnel engaged in its production. The talents of many skilled people have helped build the show's prestige over the past seven years—including writers, artists,

On location for a documentary film, the author, second from right, stages a script conference at Camp Desert Rock, Nevada.

producers, casting directors, musicians, recording experts, stylists, and many others.

Although most successful television shows depend on the drawing power of a well-known personality, *The Big Picture* does not feature any single person or name. Rather, it features the Army and the men and women who compose it, not as individuals but as members doing their part in a skilled professional organization.

But getting sufficient quantities of suitable film to satisfy a medium which gulps down material in huge amounts remains a constant problem. Camera crews frequently have to go on location to shoot the footage which cannot be found in the Army Pictorial Center's vast film library. Upcoming location filming for 1959 will include episodes on "STRAC," "Nike Hercules," "The Story of Sylvanus Thayer," and "Look Toward Tomorrow," a story about career opportunities for scientists and engineers.

Many a *Big Picture* production has been climaxed by full-scale promotion and "world premiere" programs in areas ranging from Columbus, Georgia, Ottumwa, Iowa, and Philadelphia, Pennsylvania, to Cornell University in Ithaca, New York.

On a nation-wide basis, the most spectacular promotion was through the cooperation of Remington-Rand Division of Sperry Rand in support of "The MacArthur Story" and its telecast on 331 television outlets on Pearl Harbor Day, 1958.

THROUGHOUT its wide-ranging coverage of a multitude of topics, *The Big Picture* keeps constantly in focus its primary subject, the American soldier—his mission and accomplishments in safeguarding the Nation's security.

Keeping Current With the

CONTEMPORARY MILITARY READING PROGRAM

SOLDIERS AND SCHOLARS *by John Wesley Masland and Laurence Ingram Radway, Princeton University Press, 1957, 530 pp., $7.50.*

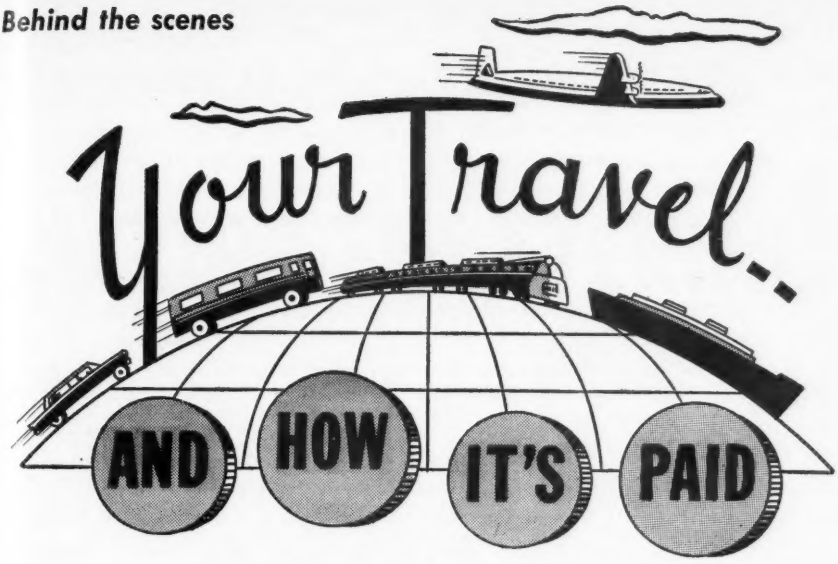
The authors, both teachers of government at Dartmouth College, have analyzed the entire structure of American military education, how the various schools came into being and the needs they fill, with emphasis on the various war colleges.

CENTURY OF TOTAL WAR *by Raymond Aron, Doubleday, 1954, 379 pp., $5.*

An analysis of some of the political, economic and ideological forces at work since the early years of the 20th century, including current problems of Cold War and East-West tension, by a distinguished French historian and journalist who edited *La France Libre,* resistance paper in London during World War II.

PSYCHOLOGICAL WARFARE *by Paul M. A. Linebarger, Association of U. S. Army, 1955. $6.*

Tracing the development of psychological warfare from Biblical days through the Korean War, the author describes techniques the enemy is likely to use, as well as United States techniques, what they mean to the soldier and how best to cooperate with specialists who handle them.



Your Travel... AND HOW IT'S PAID

Joseph F. McGowan

WHENEVER a soldier receives orders to travel—whether on permanent change of station or on temporary duty—a smoothly functioning operation is set in motion to insure reimbursement with a minimum of delay. This the soldier accepts as a matter of course. But behind the scenes a new, streamlined system for handling the payments now insures even greater efficiency, savings in manhours and costs to hundreds of Army installations, and savings in cash to the American taxpayer.

The new system has been in operation since the Management Fund was installed 1 July 1958 at the Finance Center, U. S. Army, Indianapolis, Indiana. From results so far observed, the advantages far outweigh the additional workload imposed on the Finance Center over the old method of having each installation handle its travel payments direct.

JOSEPH F. McGOWAN is a staff member of the Office, Director of Accounting, Office of the Comptroller of the Army.

Under the old system, each installation initiating obligations for transportation was required to maintain allotment records on an individual transaction basis. This meant detailed bookkeeping, with subsequent item-by-item reconciliation when the travel was completed and as bills came in from the carrier. It also meant that many interim adjustments were required to effect agreement between obligations and expenditures.

UNDER the central Management Fund, the traveler still starts on his journey when he receives a properly executed travel authorization containing the appropriate fund citation and accounting classification. But instead of the carrier being paid by the traveler's installation, payment is made from the Management Fund in Indianapolis.

Workload of the installation Finance and Accounting Office thus is lightened. Upon approval of the travel authorization, the Transpor-

tation Officer issues a transportation request to the traveler, then draws up an accurate estimate of the transportation cost. This cost then is inserted in a memorandum card copy and forwarded to the Finance and Accounting Officer of the installation. On the basis of this estimate, the original obligation is adjusted.

At the end of each month, the Finance and Accounting Officer of the installation prepares a Standard Form 1080 (Voucher for Transfer Between Appropriations and/or Funds) supported by the proper documents. These show the serial number of each transportation request, amount of obligation recorded, and the pertinent fund and accounting classification which is to be charged. A check then is drawn for the total amount, and both the check and Form 1080 are forwarded to the Management Fund. The transfer of funds is recorded as an expenditure in records of the installation.

At the Management Fund, a deposit is made and a corresponding credit is recorded in the account of the appropriation involved. When the carrier's bill is received, it is paid by the Management Fund. Periodic machine reconciliations are performed to match the expenditures with obligations.

UNDER the new system, several tangible benefits are to be observed. These include elimination of item-by-item reconciliation and resulting adjustments performed at the installation level; substitution of a block posting technique in maintaining each installation's allotment ledgers in place of detailed posting of individual transactions; liquidation of the installation's obligations on a monthly basis; reduction of over-expenditures of allotments, thus reducing the number of inadvertent violations; and elimination of the daily report of expenditures to installations.

On the other side of the ledger, an added workload of manhours and equipment was imposed on the Finance Center. The increased cost of this central funding, however, will be more than offset by the savings at field level.

Inertial Guidance for Built-in Accuracy

CREDITED as a major factor in establishing the outstanding record of the Army Redstone, the Army-pioneered inertial guidance system which controls both Redstone and Jupiter ballistic missiles is capable of guiding giant missiles accurately to targets several thousand miles distant, where guidance is critical.

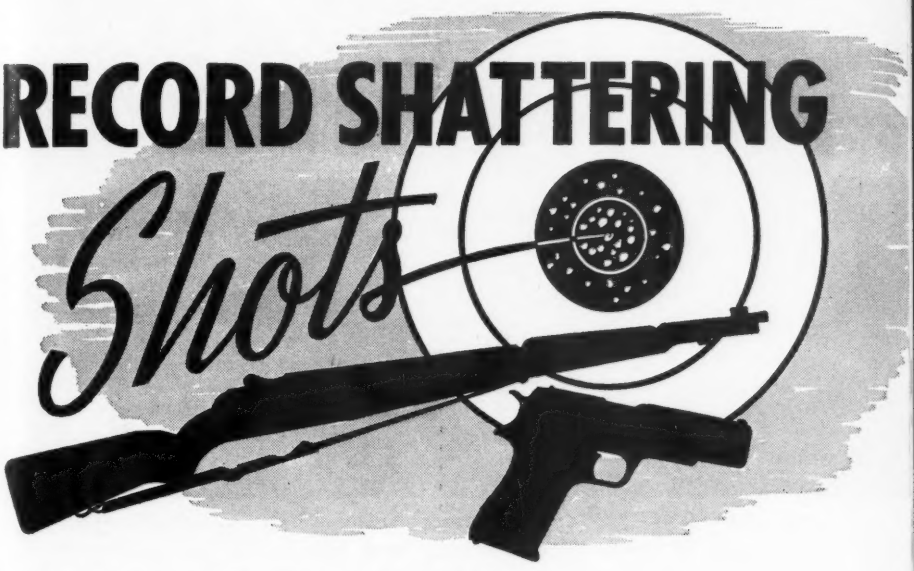
Technically known as "pendulous integrating gyroscope accelerometers," the devices utilize the principles of gyroscopic precession as a means of generating information. The mechanical devices sense the physical forces acting on the missile in flight. This information is used by the guidance system to determine errors in the missile's trajectory, which may result from wind, atmospheric pressures or other causes. From these errors, the instrument computes correction commands required to keep the missile on course. The guidance is independent of human intervention, since all elements are contained within the missile itself.

Dr. Wernher von Braun and his associates began work on the system as far back as 1937 in Germany. After World War II, they came to the United States to work for the Army and resumed development work in 1946. Decision to employ inertial guidance in Redstone was made in 1952. Today components of the system are in production in plants of Army industry contractors.

With precision of aim,

the U. S. Army Advanced Marksmanship Unit fires

RECORD SHATTERING Shots



Specialist Fourth Class King McElroy

ONE sunny morning last August a 23-year-old private fired 50 straight bullseyes to lead the U. S. Army Advanced Marksmanship Unit to a record-shattering victory in the National Trophy Team Match at Camp Perry, Ohio.

He did what no other Army rifleman had done and his team scored as no other Army team had done. Cpl. Philip Toloczko, then a private, shot a perfect score of 250 over the National Match course and his team posted a score of 1475 out of 1500, 35 points over the national record.

Meanwhile, across the seas in the Soviet Union, 1st Lt. Joe A. Deckert, an Army reservist who trained with the Advanced Marksmanship Unit, was setting a record for the world to see. The New Mexico sharpshooter fired 223 out of 250 to set a world record in winning the running deer doubles match at the World Championships in Moscow. He was one of 16 AMU shooters who earned their way on the U. S. International Team, which finished second only to the Russians in that world shooting classic.

THESE records are typical of the Unit's rapid rise to prominence in marksmanship competition. In three short years, the U. S. Army Advanced Marksmanship Unit has built a marksmanship powerhouse.

In 1956, the newly formed unit won 24 individual and team trophies at the National Matches. In

SPECIALIST FOURTH CLASS KING McELROY is on duty with the U. S. Army Advanced Marksmanship Unit, Fort Benning, Georgia.

Two ace USA AMU riflemen receive honors at World Championships at Moscow. Lt. Verle Wright, center, took first in 300-meter free rifle match while Lt. Daniel Puckel, right, was third; a Finnish shooter took second place.

1957 it won the National Trophy Rifle and Pistol Team matches, the international big-bore and small-bore rifle matches and other individual shooting titles. Last year was a record-breaking performance.

The USA AMU formula for shooting success is simple—provide the shooter the best of everything, from the rifle he fires to the jacket he wears.

The Unit commander, Colonel E. R. Mason, puts it this way: "The shooter must believe he has the best training under the best coach, that he has the best weapon worked on by the best gunsmith, and that he shoots the best ammunition available."

Development of a shooter the USA AMU way means long and continuous training in practice firing as well as his physical and mental conditioning. "You can't just hand a rifle or a pistol to an individual and expect him to be an outstanding marksman," Col. Mason points out. "All shooters need a continuous refresher course on basic principles of marksmanship."

These include dry firing and trigger squeeze exercises and continual practice firing under a qualified coach. A shooter must learn to fire under pressure and under match conditions.

OPERATING on the maxim that "one good match is worth more than one month's practice firing," USA AMU shooters annually fire in unit level matches, Army area matches, U. S. Army championship matches and numerous state and regional events.

"Participation in these matches

Special rifle built for Moscow competition is demonstrated by Army marksman 1st Lt. Daniel Puckel.

is essential to the seasoning of shooters for the National Matches," Col. Mason states. "This is particularly the case with the new shooters."

It is unit policy that all weapons are tested before being issued to a shooter, and only a USA AMU armorer is authorized to work on these weapons.

Take Toloczko's M-1 rifle, for instance. Adjustments had been made to the trigger, windage and elevation knobs on the rear sight. The trigger was fixed to remain in the same steady position over a long period, and the knobs were set at "half-minute" clicks to make for easier sight adjustments. Besides, the stock was glass bedded, enabling it to withstand the recoil and thus maintain accuracy.

TO develop the international free rifle used by 1st Lt. Daniel Puckel—the Army shooting ace who finished second in the 300 meter match in Moscow—M/Sgt. Glenn Baker combined the experience of a life's work with guns with the knowledge of Lt. Puckel's physical characteristics.

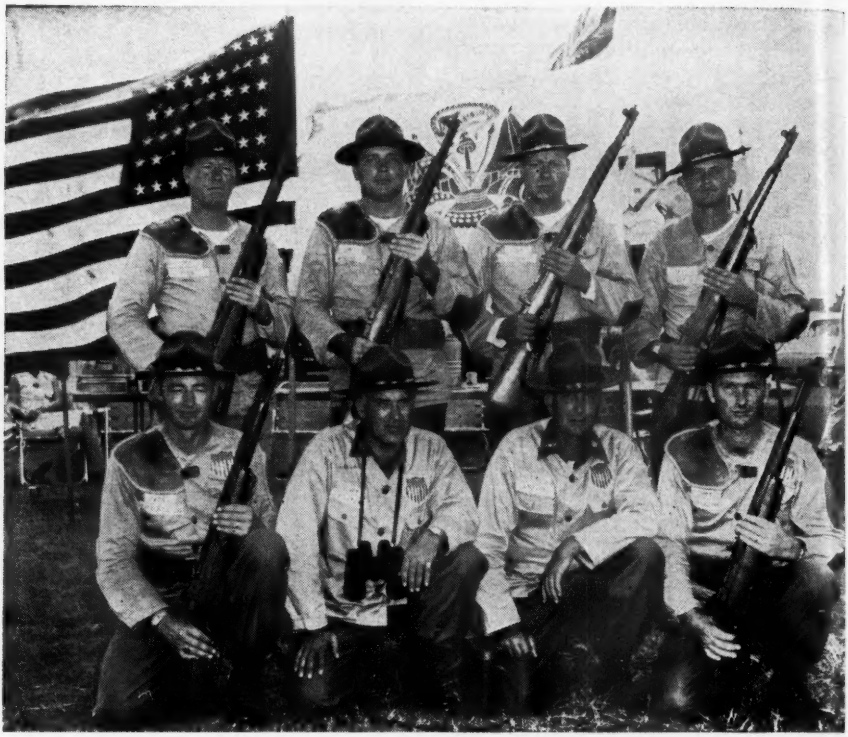
Before starting the project, Sgt. Baker conferred with Lt. Col. Thomas J. Sharpe, who heads the U. S. Army Rifle Team. He pooled Col. Sharpe's ideas with his own, and the result was an American-type international free rifle. He built a similar rifle for 1st Lt. Verle Wright, of the USA AMU, who won the prone and kneeling stages of the 300 meter match.

THOUGH the USA AMU was activated only in 1956, the history of Army marksmanship traces back to the turn of the century, when the Army started sending its most qualified riflemen to Camp Perry, Ohio. Army pistol shooters joined the National Matches after World War I.

Until 1941 the combat branches of the Infantry, Cavalry and Engineers sent ten-man teams to Perry. World War II interrupted the National Matches for 10 years.

The National Matches were resumed in 1951, and that year marked the appearance of the first All-Army rifle team. This squad laid the foundation for the creation of the "Headquarters, U. S. Army Rifle and Pistol Teams" in 1953.

With only a limited amount of equipment, ammunition and funds, the rifle and pistol teams trained during the summer at Fort Benning until 1956 when the USA AMU was formed.



Winning Infantry Trophy team—from left kneeling, M/Sgt. Marvin Fitzpatrick; Capt. Milo Foster, coach; CWO Herbert Atkins, captain; Capt. James Brannon. Standing from left, SFC James Tuck; Capt. John Parks; Sgt. Ferdinand Eysel; SFC Kenneth Evans.

The present-day unit, with an authorized strength of 178 personnel, has the finest individual and team marksmanship equipment available. It utilizes a modern, completely equipped shop staffed with experienced armorers, a recently constructed ammunition bunker, and excellent range facilities. The latter includes the only permanent international range in the United States, a six-bay international rapid fire pistol range, a seven-point indoor pistol range and a six-point indoor small-bore rifle range. A recent addition is an international running deer range to complete the unit's international shooting program.

THE unit headquarters exercises command and operational control and provides the unit's administrative, statistical, logistical and armorer support.

The Rifle Group furnishes instructors to The Infantry School at Fort Benning to assist in the conduct of the advanced marksmanship coaching course. It also sends rifle instructors to assist Army areas in conducting small arms firing schools.

The Army Pistol Group, directed

by Lt. Col. William A. Hancock, performs a similar service for the Army areas.

Both groups conduct tests of weapons, ammunition and marksmanship equipment and supervise the Army International teams.

HOW does a shooter join the USA AMU?

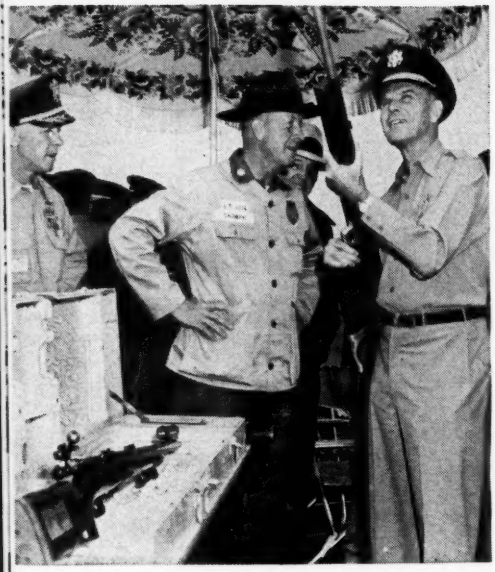
Following the Army Rifle and Pistol championships each May, the USA AMU selects the best contenders, representing the six Army areas and five overseas commands. Two months later this group is reduced in size and the remaining shooters begin their intensified training for the National Matches.

The Army Rifle Team goes to Fort Niagara for its training, while the pistol team remains at Fort Benning. Both compete in several warm-up matches before the Camp Perry championships.

Following the National Matches, the shooters return to their parent units. Shooters who have shown outstanding marksmanship ability are selected by name for assignment to the USA AMU.

FROM October to the start of a new shooting season in February, USA AMU talents are concentrated on assisting the U. S. Army

Army Rifle Team fired 1475 to crack national record in winning National Match Trophy for second straight year. Team members from left, Cpl. Philip Toloczko; Sgt. Ronald Turner; M/Sgt. William Krilling; SFC Max Herrera; Sgt. Norman Skarpness; M/Sgt. Alfred O'Neill.



Gen. Maxwell D. Taylor examines international free rifle used by Army shooters at 1958 World Championships at Moscow. Looking on at Camp Perry are Col. E. R. Mason, far left, and Lt. Col. Thomas J. Sharpe, center.

Sixty trophies won by his team at Dallas-American Grand Aggregate are admired by Lt. Col. William A. Hancock, officer in charge of the Army Pistol Team.

Infantry School to conduct a two-week advanced rifle marksmanship coaching course for officers and enlisted men on active duty, reservists and National Guard personnel.

The 88-hour course includes the study of external ballistics, use of optical instruments, range management, coaching techniques, sniper training, instructional and record firing with national match grade M-1 rifles, and planning of a unit marksmanship program.

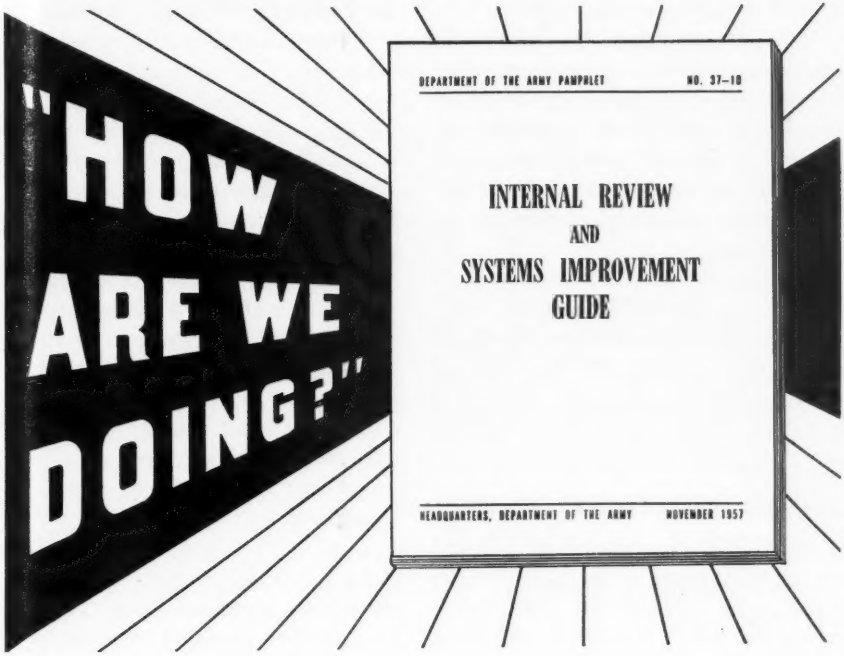
International shooting looms large in the unit's future plans. Thus far, the unit's shooters have engaged only periodically in matches with foreign countries. But now concerted efforts are underway to train some of the Army's best shooters in the international program.

While scores rise on the range, a different kind of progress continues in the quiet of the shop. The armorers behind the guns are fashioning weapons to match bullseyes with any foreign-made weapon in the world.

"While we feel sure that our free rifles will shoot as well as any in the world," Sgt. Baker declares, "this is not the final answer in rifles. We are now working on a new rifle that will almost certainly beat those we have now."

Nor is the USA AMU performance at Camp Perry last year considered the "final answer" in record-breaking for the unit. The experience of three years and the enthusiasm of this group of sharpshooters should do much in the months ahead to emblazon America's marksmanship fame over the face of the earth.

Internal review procedures help answer that perennial question—



Major Eugene D. Taber

INTERNAL review and systems improvement are among the many responsibilities of commanders and their staffs. Together, they insure the effectiveness of internal control which makes possible a day-to-day appraisal of "how are we doing?"

The commander's responsibility for internal control is almost as old as the Army itself. With the inception of the Army Financial Management Plan in 1953, responsibility for internal control was highlighted and accentuated. Under the new Plan, commanders were not given audit responsibility but were made responsible for the "proper protection and use of the assets of the organization; for compliance with policies, procedures and objectives; and for the accuracy, propriety, legality, and reliability of their actions." Internal control provides the tools which enable the commander to discharge this responsibility.

AS A result of World War II, the Army increased in size and complexity with budgets reckoned in billions of dollars as opposed to millions in the 1930's. No longer could the commander keep his office in his hip pocket or his hat.

MAJOR EUGENE D. TABER, Finance Corps, formerly Special Assistant to the Director of Accounting, Office of the Comptroller of the Army, is currently attending the U. S. Army Command and General Staff College, Fort Leavenworth, Kansas.

The command of an activity or post was now big business and had to be managed accordingly.

The commander's audit of his operations could no longer be a "compliance" type or a detailed checking of each transaction. Rather, to be economical and practical, it had to be an audit or examination of systems or ways of doing things.

How, then, could a commander know whether his systems were proper—or whether an OK from an auditor meant that he was actually operating properly? Internal control and, in particular, internal review, was the answer.

ELEMENTS OF INTERNAL CONTROL

INTERNAL control is defined by the Army as: "the plan of organization and all the coordinate methods and measures adopted within a business to safeguard its assets, check the accuracy and reliability of its data, promote operational efficiency and encourage adherence to prescribed managerial policies."

As outlined in DA Pamphlet 35-10, "The Comptrollers' Guide," internal control consists of the following elements:

- Assignment of responsibility
- Written procedures
- Checks and balances
- Internal review and systems improvement
- Internal audit

Initially the Financial Management Plan placed primary emphasis on internal audit, performed by the U. S. Army Audit Agency. The other elements were understood as concepts, most of which have been followed in the Armed Services for many years.

One principal requisite to internal review, however, proved a real obstacle. That was the stipulation that internal review should be performed by competent persons not engaged in operations. In other words, this involved setting up another segment of staff as independent agents to review operations from a completely detached viewpoint.

In these days of personnel reductions rather than increases, another staff element can only be manned by withdrawal of personnel from other areas that are already undermanned. Accordingly, a program of internal review barely got off the ground—particularly in the Class I network.

AS a means of getting the program into operation, an "Internal Review and Systems Improvement Guide" (DA Pamphlet 37-10) was published in November 1957. This pamphlet explains alternate means of getting a job done and provides a procedural guide for actually reviewing operations.

Briefly, the guide points out that although internal review and systems improvement can *best* be performed by personnel who are not engaged in operations, but are independent reviewers, it can also be accomplished by the existing staff. This can be done with one or a few individuals who are familiar with the installation's activities, who are capable of designing, adapting and revising accounting and related record-keeping systems and who are aware of their continuous review and improvement responsibilities. In this manner, the internal review program can be made to fit local mission require-

ments and personnel availability without the creation of a new staff composed of personnel taken from operating elements.

TYPES OF CONTROLS

INTERNAL control is based on the use of two types of controls—administrative, and accounting or financial. Administrative controls include the designation of the elements of an organization and the establishment of clear lines of authority, together with the fixing of responsibility and the training of personnel to do the job to which they are assigned. Accounting controls include the checks and balances built into an operation based on accounting or other record-keeping techniques. In combination, these two types of controls provide independent checks by or between two or more persons and tend to reduce the occurrence of error or fraud.

The element of *assignment of responsibility* is an administrative control and is accomplished through the determination of the appropriate organizational pattern together with the accompanying definition of mission, duties and responsibilities.

The Army, because of its size and mission, has always had a well-defined organization and chain of responsibility and authority. Through that means, responsibility is fixed and authority delegated. Varied functions and duties are separated and at the same time woven together in such a way that the mission as a whole is accomplished.

This administrative practice of assignment of responsibility constitutes a basic element of internal control. In the handling or record-keeping of materiel, functions and duties must be separated in such a way as to minimize opportunities for concealment through fictitious or improper accounting.

> *"Internal control is defined by the Army as: 'the plan of organization and all the coordinate methods and measures adopted within a business to safeguard its assets, check the accuracy and reliability of its data, promote operational efficiency and encourage adherence to prescribed managerial policies'."*

Good internal control provides that no single individual has exclusive control over physical goods, their custody or record keeping. A properly devised system of accounting could operate without division of responsibility. Without proper organization, however, it would be useless as a device to protect assets.

The *written procedures* element, of itself, does not provide control. It does, however, provide a basis for evaluation by a qualified person to determine the adequacy and effectiveness of controls. In addition, written procedures make possible uniformity and consistency in handling and recording transactions, reduce misunderstandings and provide continuity in event of personnel changes or absences. This element of internal control is, in fact, a mixture of administrative and financial controls, since the written procedures deal with both the assignment of responsibility and the detail of the functions to be performed.

Checks and balances, the third element of internal control, are built into systems of record-keeping, and constitute the financial or accounting controls. The accounting systems of the Army, both item and financial, are designed to provide for cross-checking and balancing to insure a better control over assets. The merger of administrative and financial controls permits such cross-checking to be accomplished by two or more persons with distinct responsibilities and independent data.

Examples of such built-in controls need only be identified to make them clear. Stock records have been kept in varying forms for years. They comprise a checking system which is effective so long as the person who keeps the stock records is not the same individual who issues supplies from the warehouse or even has free access to the bins and shelves.

The independent receiving of supplies under the supervision of responsible personnel is another built-in check. A lock on the side door of the supply room may be a good control, but without records to provide for an independent check on the supply room, supplies may be passed out the front door in an unauthorized manner.

At first blush, these examples seem to be far afield from accounting and appear to be purely operational functions. They are both. Record-keeping or accounting is a part of operations. It provides the means of determining the accuracy of operations and provides a day-to-day control which is required to ensure proper operation.

When one considers the handling of cash, for example, the accounting aspects of internal control become more clear. A balance to be struck at the close of business between the cashier and the accountant has the accounting flavor. Just as important, however, or perhaps of greater importance, is the accessibility of the cash drawer to other than the responsible person. This quite obviously is also a part of internal control.

EACH of these simple examples is a form of internal control, performed as part of one's assigned duties. The cashier whose responsibility for the cash is fixed will be certain that his cash drawer is safe. The supply sergeant will keep the lock on the side door. The accountant who checks out with the cashier will be certain that his records correctly reflect the amount of cash that should be on hand and agree with the cash figure in the cashier's records. It follows, then, that if checks and balances in record-keeping turn up errors or improper methods, the working individuals involved will either propose changes to their superior or go to him with their problems for a solution.

Internal review and systems improvement, the fourth element of internal control, then follows. This element is essentially twofold, consisting of (1) internal review and (2) systems improvement. Internal review is the intimate, daily review performed at the working level. Its existence is assured by the fact that persons doing the job have responsibility and authority for their functions which are recorded for them in an understandable, written manner. Also, they are working within systems which contain check

and balance guideposts to follow.

The other part, systems improvement, is that which is accomplished at the supervisory level. Within the organization, at the supervisory level, there should be qualified accountants capable of reviewing, revising and recommending improvement in accounting or related operations affecting the safeguarding of assets.

These accountants are the commander's internal review personnel —the responsible individuals who see to it that the job is done properly and with adequate control. They do not have large independent staffs performing detailed checks. Rather they exercise a realistic and practical review by utilizing the talents of persons already on the job who are aware of their responsibilities. These reviewers are an integral part of the organization, familiar with the mission and capabilities of the personnel in their particular organizational element.

Final review, of course, is accomplished by the top accountant who must be capable of providing the "know how" to solve problems presented by supervisors through development of improved techniques on a continuing basis.

REVIEW and systems improvement conducted on this basis, it should be pointed out, do not overlap the independent review made by the U. S. Army Audit Agency. Deficiencies in operations which are brought to light as a result of an audit by that Agency or other group cannot be effectively corrected or eliminated by action at departmental level to revise or refine systems. While such changes help, they would not solve basic problems of a particular installation or activity with the thoroughness of on-the-spot corrections or changes made by persons familiar with the organization and its capabilities.

This practical approach to continuous review of operations is accomplished without superimposing a group over the entire organization. Moreover, it provides a potent method to insure accuracy and propriety in operations. Finally, it enables the commander effectively to protect and utilize his resources, by a day-to-day appraisal of "how are we doing?"

Safety at Missile Sites

FOLLOWING a thorough investigation by a special civilian committee appointed to review safeguards at Nike sites, the safety procedures and safeguards in force at the Army's air defense missile systems have been given a clean bill of health. The committee, headed by Clifford F. Hood, President of U. S. Steel Corporation, reported to Secretary of the Army Wilber M. Brucker that "all practical precautions have been taken to provide safe operating systems."

The committee had visited various Nike sites, reviewing safety features, procedures and command controls. The Army was complimented on its very thorough and intelligent approach to reducing hazards of accidental nuclear reaction to a remote possibility. It was recommended that the existing program of thorough and careful training be continued with particular emphasis on selection of personnel, reduction of turnover and constant effort to eliminate human errors and personnel failures. The committee also stated that the weapons systems are essential to the Nation's security and that elements of risk normal to use of such weapons must be accepted.

MODIFICATIONS IN PENTOMIC INFANTRY, ARMORED UNITS

FOLLOWING two years of tests and intensive studies of pentomic units—studies which have borne out the validity of the original concept—minor modifications in organization of the Infantry and Armored Division and in the Armored Cavalry Regiment have been announced by the Department of the Army.

The resulting changes will not affect over-all strengths of units, but will cause some internal redistribution of personnel, all designed to improve combat efficiency by facilitating the capability to absorb new weapons systems, to improve target acquisition and combat surveillance, firepower and air and ground mobility. National Guard and Army Reserve units scheduled to undergo reorganization under the Pentomic concept will incorporate the modifications into their new structure.

PRINCIPAL improvement in the organization of the Infantry Division involves the division artillery which, in addition to its present nuclear delivery capability, will be provided with a substantial increase in conventional fire power.

Other Infantry Division improvements will include an increase from four to five in the number of rifle companies and the addition of a Combat Support Company in each battle group. The new company will include combat support elements such as reconnaissance, engineer, and assault gun platoons.

Additions to the division will include a radiological center to predict nuclear fallout, a ground radar section in each battle group, aircraft field maintenance capability, and a navigational system for control and landing of Army aircraft.

WITHIN the Armored Division, a redistribution of personnel will provide a more effective reorganization of the reconnaissance battalion companies, and the addition of an aircraft maintenance detachment to perform more complicated aircraft maintenance for the division.

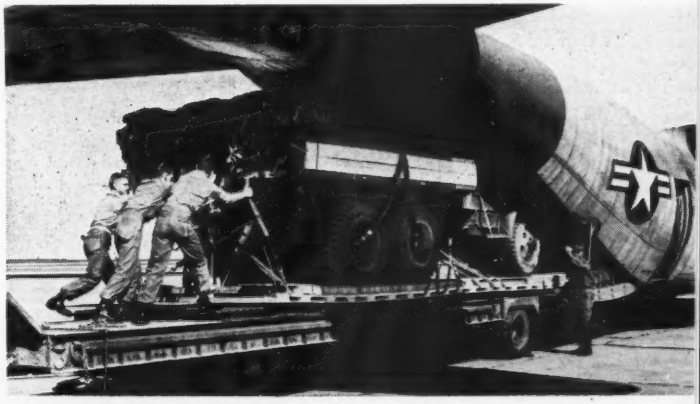
The Battalions and Companies of Armored Cavalry Regiments will be redesignated as Squadrons and Troops, respectively. The Squadrons, as modified, will have a greater capability of operating independently over widely dispersed areas.

Aircraft for the Armored Cavalry units will be increased and concentrated in the aviation companies. This will increase flexibility and the Armored Cavalry capability for aerial observation, aerial reconnaissance, target acquisition and combat surveillance.

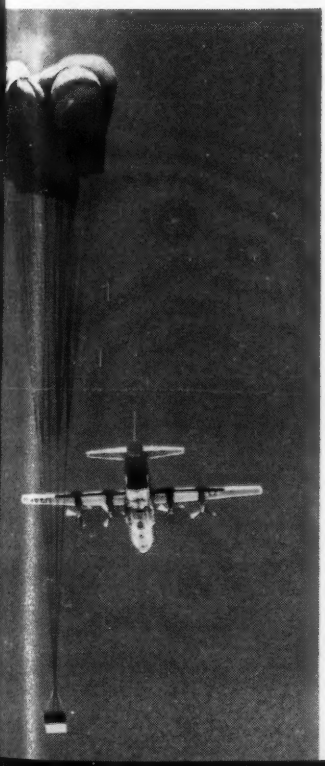
Via Air Drop—

2½-TON SPECIAL DELIVERY

THAT it is feasible to deliver heavy trucks by air to widely dispersed troops on a nuclear battlefield was demonstrated recently in tests conducted by the Army Quartermaster Corps at Yuma, Arizona. A 2½-ton truck, with six parachutes attached, was loaded into an Air Force C-130 Hercules Transport, then air-dropped from an altitude of 1500 feet.



LOADING—The truck is maneuvered into the C-130.



UNLOADING—Parachutes begin to open after truck is ejected.

LANDING—The truck touches ground, to be safely recovered.

TRAINING AIDS

Training Films recently released:

TF 5-2598, "Operator's Adjustment D-7 Tractor—Part VI—Caterpillar Cable Control."

TF 7-2634, "Jungle Operations—Part I—How to Live in the Jungle."

TF 7-2635, "Jungle Operations—Part II—Technique of Jungle Combat."

TF 9-2690, "Throttle Synchronization, M59 Armored Infantry Vehicle."

TF 16-2735, "Moderation."

TF 16-2736, "Life—My Right to Life."

TF 17-2600, "Communication in an Armor Battalion Task Force Command Post."

MF 5-8986, "The Army Package Power Reactor."

MF 16-9014, "The Christmas Spirit."

MF 46-8906, "Helicopter—Vibrations and Resonance — Part 4 — Ground Resonance."

MF 46-8998, "Flying Soldier."

GF 10-44, "Warehousing Series—Part IV—Palletized Unit Loads."

GF 10-45, Warehousing Series—Part V—Receiving and Shipping of Supplies."

AFSM 562, "I&E Screen Magazine—Issue No. 562."

ARMY EXTENSION COURSES

New Subcourses recently published:

Introduction to Guerrilla Warfare. Common Subcourse 61, SPWAR. Historical background, fundamentals, concepts, principles, legal status, characteristics of guerrilla warfare.

Advanced Gunnery and Fire Control, Light Air Defense Artillery. Arty Subcourse 42, USA Air Defense School. Review of terms and light ADA concept; tracer observation; analysis of light ADA gunnery problem; 75mm Skysweeper gunnery problems; surface firing.

Disbursing Operations—Basic Accounting Records. Fin Subcourse 117, Finance School, U. S. Army. Principles and procedures governing use and maintenance of the cash blotter, check register, cash book and subsidiary ledgers.

Military Justice XX. Subcourse 83, The Judge Advocate General's School. A consideration of jurisdiction, powers, duties of boards of review and the Court of Military Appeals; types and effects of error; the military remedy of new trial.

Revisions recently published:

Training Management, Engineer Subcourse 215, USA Engineer School. Revision of 1951 edition.

Nonappropriated Fund Accounting and Auditing, Finance Subcourse 20, Finance School, U. S. Army. Revision of 1950 edition.

Principles of Economics, Finance Subcourse 69, Finance School, U. S. Army. Revision of 1954 edition.

Military Affairs VIII, Subcourse 44, The Judge Advocate General's School. Revision of 1955 edition.

Artillery (75 and 105mm Howitzers), Ordnance Subcourse 67, U. S. Army Ordnance School. Revision of 1954 edition.

Prisoner of War Camps, The Provost Marshal General's School. PMGS Subcourse 54, Revision of 1947 edition.

Military Confinement Facilities, PMGS Subcourse 60, The Provost Marshal General's School. Revision of 1949 edition.

TRAINING LITERATURE

While the following new literature will be published shortly, units are cautioned *NOT* to requisition copies until receipt of automatic initial distribution or the items are listed in DA Pamphlets 310-1, 310-3 or 310-4.

Combat Area Signal Battalion (Army). FM 11-86 covers employment and operation of a combat area signal battalion (Army), including organization, employment, mission, equipment, operations, and capabilities.

Evasion and Escape. FM 21-77 and FM 21-77A are guides to commanders in training and indoctrination of personnel in principles and techniques of evasion and escape. FM 21-77A contains classified information.

Aerial Delivery of Supplies and Equipment: Rigging the M212 Road Grader. TM 10-500-25 illustrates procedures and techniques for rigging the M212 road grader for aerial delivery.

Revisions scheduled for publication:

FM 23-90, "81mm Mortar, M29,"— a revision of 1951 edition; supersedes FM 23-91 dated 1951 and TC 21 dated 1950.

FM 31-71, "Northern Operations"—a revision of 1951 edition, supersedes FM 31-72 dated 1951.

FM 31-72, "Mountain Operations"—revision of 1947 edition (FM 70-10).

TM 21-300, "Driver Selection and Training, Wheeled Vehicles"—revision of 1951 edition.

Overland Train for Army Transportation Corps

Model of new "overland train" illustrates precision tracking ability incorporated into the equipment, designed for rough off-road use.

ARMY Transportation Corps has awarded a contract for design and construction of a 450-foot long, 12 unit overland train for transporting heavy cargo in Arctic and other remote areas to R. G. LeTourneau, Inc., of Longview, Texas.

Development of the off-road overland train will help provide maximum mobility and high cargo-carrying capacity in remote, undeveloped locations such as polar or desert regions where supply routes are long, fuel supplies scarce and roads non-existent.

Feasibility of the overland train concept has been tested since 1956 by the Army Transportation Corps using a smaller, 4-unit experimental model.

The new 12-unit off-road train will consist of a lead or control car and ten 4-wheel, each individually powered, 15-ton cargo-carrying trailers, with a total cargo carrying capacity of 150 tons. The main generating power car will be the rearmost element. The control car will have accommodations for a six-man crew, a complete communications system and a small, separate power plant, enabling the control car to propel itself when detached from the main train. The 52-wheel vehicle will be equipped with extremely low pressure, 10-foot high, 4-ft wide tubeless tires.

One man will operate the train from an electric console located in the front of the control car. The train will attain speeds up to 20 miles per hour on level ground, accomplish turns within a 65-foot radius and will be capable of negotiating a 60 per cent slope.

Paragraphs from the PENTAGON and the FIELD

JPL to NASA

Transfer of the Jet Propulsion Laboratory (JPL) from Department of the Army to the National Aeronautics and Space Administration (NASA) has been announced by the Department of Defense. Although NASA has assumed general management of the installation in California, the Army will continue certain military projects there through the remainder of this year. These include the Sergeant guided missile program and aerodynamic testing and research. Arrangements later will be by mutual agreement.

Recognizing the often inseparable nature of national efforts to meet both military and scientific objectives in the fields of space and missiles, provision has been made for continuing the organizational strength of the Army Ballistic Missile Agency of the U. S. Army Ordnance Missile Command. NASA requirements for projects to be accomplished by the Army will be placed directly upon the Missile Command, although they will be funded by NASA.

Expediting R & D

As part of a continuing program to put new weapons and equipment into the hands of troops faster, the Department of the Army has incorporated in Army Regulations 705-5 procedures designed to cut "lead time," or the period between conception of an idea and the production of hardware.

The new regulation describes measures to cut lead time by beginning production engineering early in the development cycle, the use of standard parts in research and development equipment, and reducing the testing period without detracting from weapon or equipment reliability.

STRAC in Amphibious Exercise

Tests of vertical envelopment tactics using helicopters were conducted as a feature of the joint Army-Navy Exercise "Rocky Shoals" at Hunter Liggett Military Reservation recently. In this first Strategic Army Corps amphibious operation, helicopters used the first operational helicopter carrier, the *U. S. S. Thetis Bay*, from which to transport troops and food well beyond the beach area. The troops surrounded enemy units and knocked them out with low-yield atomic weapons. All together, more than 13,000 soldiers and 12,000 sailors manning 40 ships participated. Because of the nuclear weapon capability of both forces, ships were widely dispersed and troops were landed at separated points.

Engineer Dredge to Suez

The giant, sea-going dredge *"Essayons"* of the Corps of Engineers has been leased to the Suez Canal Authority for essential channel dredging of international importance in the Mediterranean Sea and the Suez Canal. Dredging of the Mediterranean end of the Canal is part of the program to allow passage of vessels with deeper draft. The vessel, of 22,000 tons displacement loaded, is capable of moving more than a million cubic yards of material a month. The dredging mission will require six months.

German Missilemen

In an international ceremony, 110 officers and airmen of the new German Air Force have been awarded diplomas after receiving formal training in missiles at the U. S. Army Ordnance Guided Missile School, Huntsville, Alabama. The students were the first German military men to receive training in missiles since the end of World War II. They now have been formed into tactical ordnance units for continued training. By spring they will proceed to the Army Air Defense Center, Fort Bliss, Texas, for training in actual firing of Nike-Ajax and Nike-Hercules missiles.

Unit Histories

In order that each unit commander may have available documentary evidence relating to his unit's history, traditions and right to its organizational properties, provisions have been made under AR 220-306 for retention of various items and for storage during the owning unit's inability to care for them. Each unit authorized an organizational color or a distinguishing flag will establish and maintain a unit historical document file. Guidon-bearing units organic to a division may establish and maintain unit historical document files at their discretion, as may other numerically designated TOE units.

Installation Closings Planned

As part of a continuing review to improve overall efficiency and economy within the Army, three installations are scheduled to be closed during the summer of 1959. They are Fort Polk, Louisiana; Fort Chaffee, Arkansas; and Fort Miles, Delaware. The major unit at Fort Polk, Armored Combat Command A, will be moved to another installation. Training activities at Fort Chaffee will be absorbed by other Army Training Centers. Fort Miles, primarily a firing range for conventional antiaircraft artillery units now being phased out of the Active Army, will continue to be used for reserve components antiaircraft training.

Downward Trend

Decline in prisoner population throughout the Army has resulted in closing of three Disciplinary Barracks — at New Cumberland, Pennsylvania, Fort Gordon, Georgia, and Fort Crowder, Missouri— since 30 June 1957.

Latest available data indicates a decided downward trend in number of prisoners, confinement rates, and general court-martial trials. As of 30 June 1956, there were 4,359 prisoners in confinement in U. S. Disciplinary Barracks, with a confinement rate per thousand of 4.3 and rate per 100,000 per month of persons tried by general court-martial of 54.1. As of 30 November 1958, the figures were 1,530 confined, a confinement rate per thousand of 1.3, and rate for persons tried of 18.2.

Drone Becomes Swallow

Designed to swoop over a battlefield to gather military information, the Swallow, a small turbojet and pilotless aircraft, is the latest surveillance drone under development for Army use. It will use a variety of advanced techniques including radar, infrared and photography. In operation, it can be fired into the air with aid of rockets which will be separated when airborne to allow the turbojet engine to take over. Missions may be

Recent Progress in Space Research

TWO giant strides have been taken in the science of space penetration—one the successful launching of a tiny monkey in the nose cone of a Jupiter Intermediate Range Missile; the other, relaying messages to and from the orbiting Atlas missile circling the earth.

In the first instance, space medicine experts hailed the successful flight as a necessary step in national programs for manned space flight. Although the nose cone was not recovered, valuable data was recorded on heart beat, respiration rate and other bodily functions of the small South American squirrel monkey. The experiment was a scientific-biological project conducted for the Department of Defense jointly by the Surgeons General of the Army and Navy.

THE orbiting communications relay inside the Atlas missile is regarded as a first step toward "courier" satellites for military communications. The payload, provided by the Army Signal Corps, consisted primarily of transmitting, receiving and recording equipment designed to receive, store or relay messages from ground stations. When in range of these stations, the orbiting relay can receive and transmit seven written messages and one voice message at one time.

The entire project—called Project Score, an abbreviation for Signal Communications by Orbiting Relay Equipment—was conducted under auspices of the Advanced Research Projects Agency. The Army's contribution was developed by the Signal Corps in cooperation with the Astro-Electronics Products Division of the Radio Corporation of America and other firms.

carried out by a pre-programmed automatic guidance system or by ground or air controls. The Swallow, designated SD-4 by the Army, is being developed and produced under contract by Republic Aviation Corporation's Guided Missiles Division for the Army Signal Corps.

Electric Powered Firefighter

First application of electric-powered pumps to a firefighting vehicle has been made by Corps of Engineers at Fort Belvoir, Virginia. A self-operating pumper trailer has been developed by the Firefighting Branch of the Engineer Research and Development Laboratories for use at Nike missile installations. Powered by two electric pumps, each with a capacity of 50 gallons a minute at a pressure of 100 pounds per square inch, the unit also features a gasoline-fired heater and decontamination shower for personnel.

Army Work Uniform for Air Force

In an action estimated to result in annual saving of over three million dollars, the Air Force has officially adopted the Army's work uniform. The newly adopted items will be included in the airman's clothing allowance.

Airlift for Aircraft Maintenance

A lightweight aircraft maintenance shop that can be airlifted by helicopter is being developed for use by Army Aviation units. Two versions of the shops will weigh less than 4,000 pounds when fully loaded with lightweight tools and leveling jacks for setting up on uneven terrain. One design incorporates a lightweight, readily detachable wheel suspension for ease in ground transporting. The other is erected on skids. Both have rings for helicopter or crane lift or for towing behind military vehicles. Except for limited supporting equipment such as air compressor, electric generator, and portable heating equipment, they are entirely self-contained. Development is under direction of the U. S. Army Transportation Research and Engineering Command, Fort Eustis, Virginia.

Background on Berlin

Historical background of the Berlin occupation and the United States position under existing conditions are set forth in newly issued Department of Defense Fact Sheet 1-G, "West Berlin: Free World Outpost." The fact sheet now is being distributed to major commands.

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COMMAND LINE

ON MAINTAINING PEACE

"To achieve . . . peace we seek to prevent war at any place and in any dimension. If, despite our best efforts, a local dispute should flare into armed hostilities, the next problem would be to keep the conflict from spreading, and so compromising freedom. In support of these objectives we maintain forces of great power and flexibility."

President Dwight D. Eisenhower, in his State of the Union Message to the Eighty-Sixth Congress, 9 January 1959.

ON MEETING LIMITED AGGRESSION

"Limited aggression cannot be deterred or halted by remote control. In this nuclear era, strong and effective Army forces, able to cope with any foe, any time, any place, and on any terms, as part of a unified land, sea, and air command, are more essential than ever before to our national security and the prevention of war. The fighting man on the ground is still the fundamental factor of decision—the only 'ultimate weapon.'"

The Honorable Wilber M. Brucker, Secretary of the Army, before the New England Conference for Economic Development, Boston, Massachusetts, 21 November 1958.

ON OUR ARMY OVERSEAS

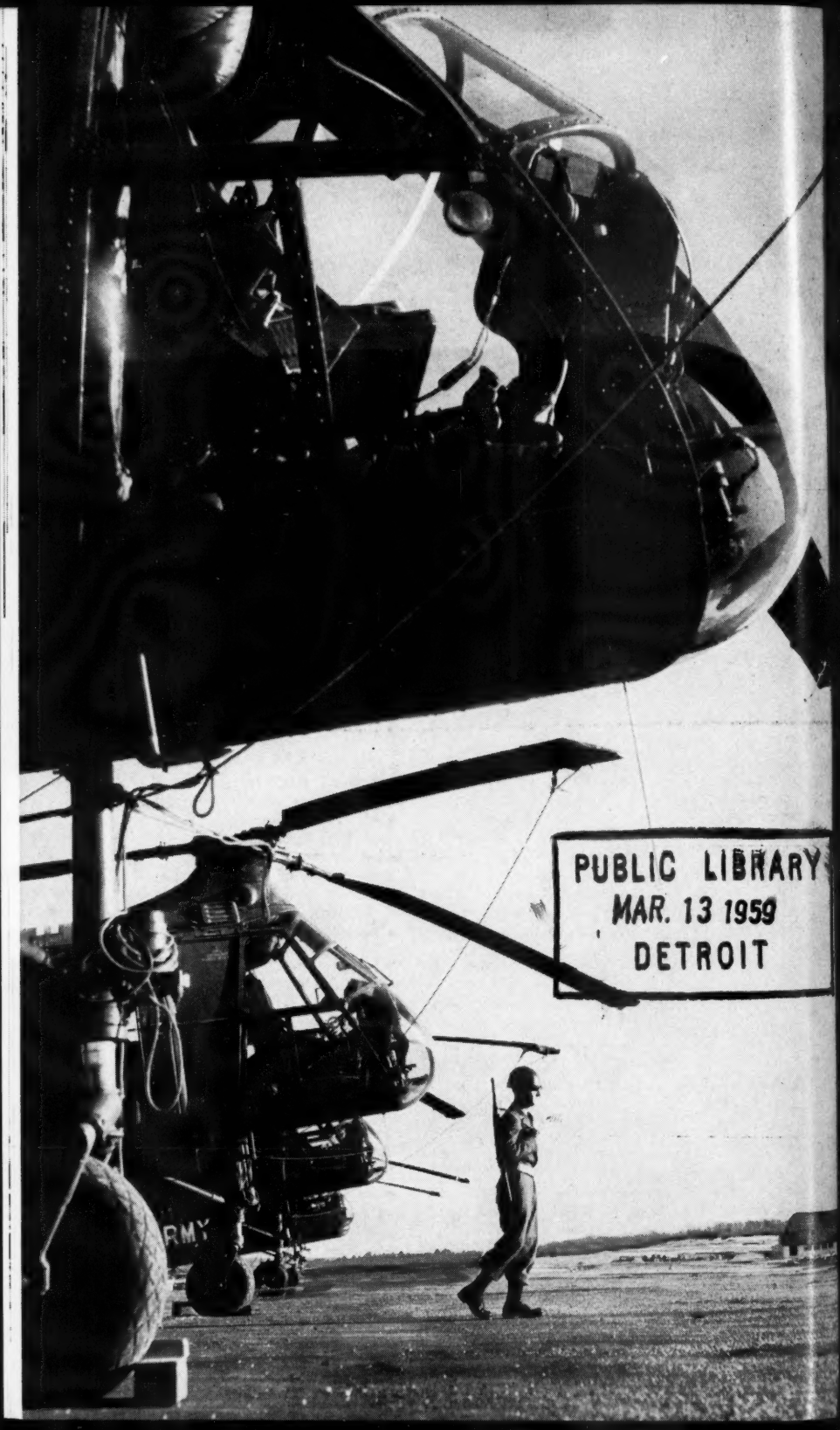
"What is the Army doing overseas in the course of discharging its varied missions? First and foremost, it is being a deterrent force—contributing to the prevention of war wherever the Army is deployed. The presence of American servicemen along the Iron and Bamboo Curtains, ready to fight if necessary, is a constant reminder to any potential aggressor that he will be met promptly by the power of the United States. That fact is a sobering reminder of the serious consequences which an aggressive adventure would entail. As an additional deterrent, we are creating local strength through training local forces, often in areas where only weakness existed before as an invitation to an aggressor."

General Maxwell D. Taylor, Army Chief of Staff, before the United States Conference of Mayors, Miami Beach, Florida, 13 September, 1958.

ON INCREASING ARMY FIREPOWER AND SPEED

"In my opinion, the Army should be a compact, mobile, hard-hitting outfit with a minimum of supporting impedimenta. The majority of combat equipment should be capable of movement by air or fast ship. In the past we have paid a lot of attention to protective measures such as heavy armor on tanks and other vehicles. The resulting weight has created mobility and engine efficiency problems. I believe the emphasis should be on firepower and speed. Let the protection come through those characteristics. I realize that the Army has been doing a lot in these areas. All of us know that more needs to be done."

Gen. Nathan F. Twining, USAF, Chairman, Joint Chiefs of Staff before the Association of the United States Army, Washington, D. C., 21 October 1958.



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